

IMPACT OF ELECTRONIC BANKING INSTRUMENTS ON THE INTERMEDIATION EFFICIENCY OF THE NIGERIAN ECONOMY

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ABSTRACT

This study examined the impact of selected e-payment instruments on the intermediation efficiency of the Nigerian economy. Using time series data of 2006 – 2011 the study employed multiple regression technique in the analysis of the sourced data. Employing intermediation efficiency indicator (the ratio of currency outside bank to broad money supply) as a dependent variable, while the automated teller machine (ATM), point of sales (PoS), Mobile and Internet service values were used as the independent variables, the following findings were made: that there is significant relationship between ATM, PoS, Internet service values and the intermediation efficiency of the of Nigerian economy. However, the study also reviles that there is no significant relationship between Mobile service value and intermediation efficiency of the Nigerian economy within the period under study. The implication of these finding is that the ATM, PoS and Internet services are the major instruments used by the customers of the deposit money banks in Nigeria, may be as a result of the level of awareness created by the banks in Nigeria. On the other hand the insignificant contribution of the Mobile service value to intermediation efficiency may be as a result of the user's ignorance or the banks' insufficient effort in selling the product effectively. Further more the result implies that the higher the usage of the selected e-payment instruments in Nigeria the better the intermediation efficiency of the Nigerian economy. Therefore this study recommends that the banks should put more effort in advertising these products in Nigeria. Improved internet and information technology awareness for the public in form of seminars and conferences will cause an upswing in e-payment techniques usage. This may cause a positive impact on the usage of these instruments by the customers of the deposit money banks in Nigeria and hence improve the intermediation efficiency of the Nigerian economy.

Keywords: electronic banking, intermediation efficiency, Nigeria.

BACKGROUND OF THE STUDY

Before the emergence of modern banking system banking operations was manually done and this may have led to a slow down in the settlement of transactions. This system involved posting transactions from one ledger to another manually. Counting of money was done manually which were sometimes not accurate and these may have resulted to errors. 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 computers and telecommunications to enable banking transactions to be done by computer or telephone instead of human interaction. (Before the early 1980s, it really took off with the arrival of the world- wide-web when traditional banks offered their clients account access online while some new banks started). 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. Some banks offer home banking, whereby a person with a personal computer can make transactions either via direct connection or by accessing a website. Through the computer-and-telephone based systems, bank customers can check deposits, move money from one account to another, pay bills, set up new accounts, request for loans, and invest spare cash any time of the day or night. Electronic banking has vastly reduced the physical transfer of paper money and coins from one place to another. Electronic fund transfer now involves many different types of transactions. It uses computer and electronic technology as a substitute for cheque and other paper transactions. This was initiated through devices like cards or codes that let you access your account. Many financial institutions use ATM or debit cards, pay by phone and personal identification numbers (PINS) for this purpose.

Nigeria did not embrace electronic banking early, compared to developed countries of the world. In the year 1986, Societe Generale Bank of Nigeria (SGBN) introduced online, real-time banking within its 5 branches in Lagos metropolis. However, many of the Nigerian banks adopted electronic banking system in the early 2000s. Today the ATM, Mobile, Web, and POS are major e-payment instruments currently in use in Nigeria. In the recent years electronic banking has been viewed as a driving force that is changing the landscape of the banking industry fundamentally, in particular, towards a more competitive industry. E-banking has blurred the boundaries between different financial institutions, enabled new financial products and services and made existing financial services available in different packages (Agbala, 2008).

Before the introduction of electronic banking system, the use of raw cash transactions was said to have bred armed robbery and corruption through the ‘cash and carry syndrome’ usually linked with the swift movement of Ghana must go bags by some unscrupulous individuals. Today electronic fund transfer allows money to be sent by one party in a destination to another party located differently through money transfer agent while the sender may have paid physical cash at the money transfer agency, the cash does not move physically, what move is information.

STATEMENT OF THE PROBLEM

Most developed and some undeveloped countries has witnessed success stories in this century in banking technology, such technologies like the ATMs, Local Area Networks (LAN), Wider Area Networks (WAN), credit cards, electronic point of sales (PoS) systems, imaging systems, information filling systems, integrated banking system and client information filling (CIF) systems are now being routinely used by many banks to ensure a more efficient and effective operations. Nigeria is presently not left out. The use of various forms of e-payments has grown significantly within and after the past decade. For instance the volume and value of transactions of various forms of e-payment stood at 114.6 million

and 645.04 billion naira, respectively in 2009, showing an increase of 73.4 and 46.1 percent, respectively when compared with 66.1 million and N441.6 billion in 2008 (CBN, 2009)

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. The application of these instruments over the years may have impacted negatively or positively on the intermediation efficiency of the Nigerian economy, hence the need for this paper. This study seeks therefore to empirically address the implications of electronic banking instruments on the intermediation efficiency (the ratio of currency outside bank to broad money supply) of the Nigerian economy (2006-2011).

Based on above the general objective of this work is to ascertain the impact of electronic banking instruments on the intermediation efficiency in Nigeria, while its specific objectives are:

- i. To ascertain the impact of ATM service value on the intermediation efficiency of the Nigerian economy.
- ii. To ascertain the impact of Internet (web) banking service value on the intermediation efficiency of the Nigerian economy.
- iii. To ascertain the impact of POS service value on the intermediation efficiency of the Nigerian economy.
- iv. To determine the impact of mobile banking services value on the intermediation efficiency of the Nigerian economy.

CONCEPTUAL FRAMEWORK

In Anyanwokoro (1999), electronic banking is defined as the application of computer technology to banking especially the payment (deposit transfer) aspects of banking. He also defined e-banking as a system of banking with an electronic communication network which permits on-line processing of the same day credit and debit transfers of funds between member institutions of a clearing system.

Electronic banking offers the convenience of conducting most of the banking transactions at a time that suits the customer. The customer can access funds and transfer funds between accounts, pay bills and make purchases 24 hours a day as well as 7 days a week (Zakaria, 2006).

Omotayo (2007) defines electronic banking as a system in which funds are moved between different accounts using computerized online or real time systems without the use of written cheques.

Kondabagil (2007) noted that “electronic banking is like traditional payment, inquiring and information processing systems, differing only in that it utilizes a different delivery channel. For banks to stay on track of competition there is need to be aware of the rapid and continual growth of information technology and telecommunications which encourage the introduction of electronic services of the banking activities.

In Georgesan (2008), electronic banking is defined to include the provision of retail and small value banking products and services through electronic channels as well as large value electronic payments and other whole sale banking services delivered electronically.

In Aburime (2008) electronic banking includes systems that enable financial institutions, customer, individual and businesses to access accounts, transact business or obtain information on financial products and services through public or private networks including the internet. Customers access electronic banking services using an intelligent electronic device such as a personal computer (PC) personal digital assistant (PDA), Automated Teller Machine (ATM), among others.

In Edet (2008), electronic banking is defined as a system by which transactions are settled electronically with use of electronic gadgets such as ATMs, POS terminals, GSM Phones and v-cards etc handled by e-holders, bank customers and stakeholders. Banking over the internet has attracted increasing intention from banks and other financial services industry, from participants, the business press, regulators and law makers, both in Nigeria and other countries.

Khrawish and Al-Sadi (2012) defined electronic banking as the adoption of electronic means in the delivery of banking products and services. Such products and services include deposit taking, lending and payment products and provision of other electronic payment product and services such as electronic money.

From the above definitions so far, the researcher therefore defines electronic banking as the delivery of banking products and services to the customers and general public electronically through the use of electronic banking instruments or products like Automated Teller Machine (ATM), Mobile, internet (Web), and point of sales (POS) among others.

EMPIRICAL REVIEW

Agboola (2001) studied the impact of computer automation on banking services in Lagos using 6 banks and concluded that electronic banking has tremendously improved the services of the banks to their customers.

Lustsik (2004) explores the implementation of techniques of activity-based-costing (ABC) in the banking sector on the example of Estonia bank in order to analyze the cost structure for traditional and electronic channel transactions. The methodology and empirical parts of the study were based on Hans bank's analysis and statistical report as well as on Hans banks internal documents that stipulate rules for cost allocation and limit cost calculation. The findings of the study revealed that banks additional profits on the transactions effected via electronic channel banking services have high profitability for banks, as the absolute unit cost numbers are lower than those of fees collected from clients.

Trajhavo (2005) carried out an empirical investigation on the impact of electronic banking on bank profitability. The study was designed to test profit sensitivity to such factors as the size of institution in terms of both number.... The model of the study projects profitability measured in net present value and internal rate of return over a five years time horizon considering anticipated migration of customers from traditional to online channels. The results of the study revealed that it is not possible to blindly state that internet banking is always profitable because very small institutions only offer a limited set of internet banking and are not likely to achieve profit unless they are able to persuade a very substantial portion of their customers to bank online; that internet banking provides financial institutions with array of applications including home banking with electronic bill payment, check images, authenticated online applications, online statement modules, e-commerce finance services

portal and online lending application for consumers loans. The implication of the study above is that there will increase in bank performance if the use of electronic banking system is improved and practiced in Nigeria irrespective of size.

Siam (2006) 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 were 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.

Hernando and Nieto (2007) 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 take to appear. 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).

Onay, Ozsoz and Ash (2008) 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 macro economic 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 confirming the findings of Hernando and Nieto while a negative impact is also observed for one and half years of its adoption.

Madueme (2010) studied the impact of ICT on banking efficiency in Nigeria employing a survey of 13 banks. Based on the CAMEL rating and a transcendental logarithmic function of the banks, it was revealed that the efficiency values obtained through the CAMEL rating system were higher during post adoption era than before adoption and estimated that a 1% increase in ICT capital on average leads to 0.9185 Naira increase in bank output post ICT adoption era.

Maiyaki and Mokhtar (2010) 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. They 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.

Carrallio and Siegel (2011) investigated the return on investment for online banking services an analysis of financial account aggregation. The return on investment of the account

aggregation technology was evaluated using the calculation of earning before interest and taxes (EBIT) and the net present value (NPV) for a period of five years. The sample covers three basic bank sizes according to the number of its online accounts; medium banks those with 2.8 to 6.0 million online accounts and large banks, those with 8.8 to 16 million online accounts. The study concluded that account aggregation is a compelling technology that should become a commodity in the sense that most important banks will provide it and it will represent no more a differentiated competitive advantage.

This study employed descriptive (survey) design as its methodology while using multiple regression for the analysis of the time series data from 2006-2011. The major deviation of this study is that it studies the impact of electronic banking instruments on the intermediation efficiency of Nigerian economy. It also employed disaggregated and selected e-payment instruments and used data involving all the deposit money banks in Nigeria.

THEORETICAL FRAMEWORK/ MODEL SPECIFICATION

The underpinning theory employed in this work is a theory arising from intermediation efficiency in an economy. This theory considers broad money supply and currency outside banks as major determinants of the interplay of other macro variables in the efficient management process of a given economy. The theory argues that the lesser the ratio of currency outside banks to broad money supply the higher the intermediation efficiency and vice versa. This suffices that when the currency outside banks diminishes as a result of the increase in the use of electronic forms of payment, particularly ATM and other e-card products, as well as banking habits, the intermediation efficiency will be positive, otherwise it will be negative. Based on the assumption above we may therefore specify the below equation: $COB/M2 = F(ATM + POS + MOB + BH) \dots$ (1)

The above equation can be stated as follows or could be modified and transposed to reflect an intermediation efficiency model as follows:

$$IE = ATM + POS + MOB + INTS + U_t \dots$$
 (2)

Therefore we state the above as follows:

$$IE = b_0 + b_1 ATM + b_2 POS + b_3 MOB + b_4 INTS + U_t \dots$$
 (3)

Where

IE = 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. ATM = automated teller machine service value service value, POS = point of sales service value, MOB = mobile service value and INTS = internet service value.

RESULTS/DISCUSSIONS

Dependent Variable: LOG(COB)

Method: Least Squares

Date: 07/21/13 Time: 17:18

Sample: 2006 2011

Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-76.20970	24.11575	-3.160163	0.0009

LOG(ATM)	20.69205	4.888665	4.232658	0.0015
LOG(WEB)	6.551412	1.029721	6.362318	0.0002
LOG(POS)	6.427984	0.849191	7.569539	0.0000
LOG(MOB)	0.103119	0.346159	0.297895	0.8157
R-squared	0.888390	Mean dependent var	2.342530	
Adjusted R-squared	0.441951	S.D. dependent var	0.256745	
S.E. of regression	0.191795	Akaike info criterion	-0.589869	
Sum squared resid	0.036785	Schwarz criterion	-0.763402	
Log likelihood	6.769606	F-statistic	198.9947	
Durbin-Watson stat	2.967936	Prob(F-statistic)	0.000077	

Source: Eviews Result

T test result

The t test is used in the statistical test to test for the significance of the individual estimated parameter(s). The calculated t-test value for LOG(ATM), LOG(WEB), LOG(POS), LOG(MOB) are 0.232658, 0.362318, 0.569539 and 0.297895 respectively while their associated P-values are 0.0009, 0.0015, 0.0002, 0.0000 and 0.8157.

Since the P-values of the estimated parameters are less than the chosen level of significance 0.05 (5%) apart from the p-value of LOG(MOB), we reject the null hypotheses (Ho) and accept the alternative hypothesis. This means that the estimated parameters such as LOG(ATM), LOG(WEB) and LOG(POS) are statistically and individually significant. The Hi is accepted on the proposition that LOG(ATM), LOG(WEB), LOG(POS) has significant effect on the Nigeria’s intermediation efficiency within the chosen period of study.

Standard Error Test (s(b))

This is used to test for the reliability of the coefficient estimates. Decision Rule: If $s(b_0) < b_0^{1/2}$, we accept that the coefficient estimate is statistically reliable. Based on our result above the following computations hereunder were made.

$$S(b_1) = 4.888665, b_1^{1/2} = 20.11575/2 = 10.058$$

$$S(b_2) = 1.029721, b_2^{1/2} = 6.551412/2 = 3.276$$

$$S(b_3) = 0.849191, b_3^{1/2} = 6.427984/2 = 3.214$$

$$S(b_4) = 0.346159, b_4^{1/2} = 0.103119/2 = 0.052$$

Since $S(b_1) < b_1^{1/2}$, $S(b_2) < b_2^{1/2}$ and $S(b_3) < b_3^{1/2}$, which represent the parameter estimates of LOG(ATM), LOG(WEB), LOG(POS) respectively, therefore we accepted H₁ and conclude that the coefficient estimates of LOG(ATM), LOG(WEB), LOG(POS) are statistically reliable. However, the coefficient estimate of LOG(MOB) is not statistically reliable as $S(b_4) > b_4^{1/2}$,

Coefficient of Multiple Determination (R²)

It is used to measure the proportion of variation in the dependent variable that is explained by the explanatory variable(s). The higher ‘the’ R², the greater the proportion of the variation in the independent variable(s)

$$R^2 = 0.888390$$

The computed coefficient of determination ($R^2 = 0.888390$) shows that 88.8% of the total variation in intermediation efficiency of the Nigerian economy (IE) is explained by the variations in ATM service value, WEB service value, POS service value and MOB service value while 11.2% of the variation in COB, is attributable to the influence of other factors not included in the regression function.

Durbin Watson Statistics (Dw)

It is used to test for the presence of autocorrelation. The level of significance used in this model is 5%.

DECISION RULE: If the computed Durbin Watson Statistics is less than the lower limit, there is evidence of positive first order serial correlation (autocorrelation) but if it is greater than the upper limit, there is no evidence of positive first order serial correlation. However, if it lies between the lower and upper limit, there is inconclusive evidence regarding the presence or absence of positive first order serial correlation. The lower and upper limits of the tabulated Durbin Watson statistics are 0.610 and 1.400 while the computed value is 2.97. Since the computed value (2.97) is greater than the upper limit value (1.400), there is no evidence of first order serial correlation, i.e. no autocorrelation.

SUMMARY AND CONCLUSION

Employing intermediation efficiency indicator (the ratio of currency outside bank to broad money supply) as a dependent variable, while the automated teller machine (ATM), point of sales (PoS), Mobile and Internet service values were used as the independent variables, the following findings were made: that there is significant relationship between ATM, Mobile, Internet service values and the intermediation efficiency of the of Nigerian economy. However, the study also reveals that there is no significant relationship between Point of sales (PoS) service value and intermediation efficiency of the Nigerian economy within the period under study. The implication of these finding is that the ATM, Mobile and Internet services are the major instruments used by the customers of the deposit money banks in Nigeria, may be as a result of the level of awareness of these products made by the banks in Nigeria. On the other hand the insignificant contribution of the PoS service value to intermediation efficiency may be as a result of the user's ignorance or the banks' insufficient effort in selling the product effectively. Further more the result implies that the higher the usage of the selected e-payment instruments in Nigeria the better the intermediation efficiency of the Nigerian economy.

The study therefore concludes that there exist a positive relationship between the independent variables (selected e-banking instruments) and the dependent variable (intermediation efficiency of the Nigerian economy) within the period of study.

RECOMMENDATIONS

Therefore this study recommends that the banks should put more effort in advertising these products in Nigeria. Improved internet and information technology awareness for the public in form of seminars and conferences will cause an upswing in e-payment techniques usage. Again the central bank of Nigeria should as much as possible continue the implementation of the cashless economy process that is presently ongoing in Nigeria. This may cause a positive impact on the usage

of these instruments by the customers of the deposit money banks in Nigeria and hence improve the intermediation efficiency of the Nigerian economy.

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