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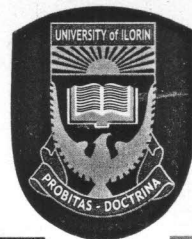
IMPACT OF ELECTRONIC PAYMENT SYSTEM ON CASH USAGE IN THE NIGERIAN FINANCIAL SYSTEM

By

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Abstract

Nigeria is a heavily cash oriented economy with retail and commercial payments primarily made in cash. It is expected that the electronic payment system adopted in the Nigerian banking industry will reduce the amount of physical cash used for transactions and the long queue witnessed in the banking halls. Despite the series of technological innovation of the e-settlement system, the CBN still posited in 2013 that cash usage is very high, as it represented over 99 percent of the total transactions as at December, 2012. This study therefore, examined the electronic payment system and cash usage in Ilorin metropolis of Kwara State, Nigeria. Primary data was obtained through the questionnaire for this study. Data obtained were subjected to dprobit, probit and logit regressions, using the Statistical Tool for Analyses (STATA 11.0). The outcome of this study revealed that: (i) Electronic Payment System has significant impact on cash usage; and (ii) factors influencing the adoption of e-payment facilities include its user-friendliness, convenience, usefulness and its ease-of-use. The study therefore, recommends that the Central Bank of Nigeria should put in place an e-transact policy to encourage more users to adopt the e-platform. If the above recommendation is fully implemented, more users are likely to adopt the technology in carrying out their transactions, which will in-turn have positive effect on the Nigerian financial system.

Keywords: Electronic Payment System, Cash Usage, and Nigerian Financial System **JEL Code**: E42

1.0   INTRODUCTION

Nigeria is a heavily cash oriented economy with retail and commercial payments primarily made in cash. Indeed, cash is a strong motivator in Nigeria's highly informal economy. According to the Central Bank of Nigeria (2013), cash related transactions represented over 99% of customer activity in Nigerian banks as at December 2012.

At the end of the 1980's, the use of cash for purchasing consumption goods in the US has constantly declined (Humphrey, 2004). Hence, most of the less developed countries like Nigeria are on the transition from a pure cash economy to a 'cash-less' one for developmental purposes. Little wonder why the Central Bank of Nigeria recently introduced cash-less policy (Odior and Banuso, 2012).

The payment system plays a very crucial role in any economy, being the channel through which financial resources flow from one segment of the economy to the other. It, therefore, represents the major foundation of the modern market economy. In Nigeria, there are three pivotal roles for the payments system, namely: the Monetary Policy role, the financial stability role and the overall economic role (Central Banking of Nigeria, 2013).

The cost of transacting with cash in the Nigerian financial system was estimated to be ₦114.5 billion in 2009 and reaching ₦192 billion in 2012. Based on the 2009 statistics, 24%, 67% and 9% of the cost of cash are related to Cash in Transit Cost, Cash Processing Cost and Vault Management Cost respectively (Central Bank of Nigeria, 2012). According to Nwaolisa and Kasie (2012), "electronic retail payment has been designed to help individual customers and companies as well as the banks in eliminating or reducing some of the problems inherent in the settlement and payment process". However, despite the series of technological innovation that have been adopted in the Nigerian banking industry, cash usage is still very high as cash related transactions represented over 99% of customer activities in Nigerian banks as at December 2012 (CBN, 2013). May be the challenges associated with the use of the electronic payment system outweighs transacting with cash , that is why cash transactions have not reduced in the banking halls as expected. Therefore, this study tries to evaluate the impact of electronic payment system on cash usage in the Nigerian Financial System. The specific objective of this study is to examine the factors influencing the adoption of e-payment system.

2.0   REVIEW OF LITERATURE

2.1   Conceptual Issues

Electronic Payment System

Most modern payment systems employ cash-substitutes. E-payment involves settlement via direct credit, electronic transfer of credit card details, or some other electronic means, as opposed to payment by cash and cheque (Zika, 2005; and Agabonifo, Adeola and Oluwadare, 2012).   Electronic payment refers to cash and associated transactions implemented using electronic means (Humphrey, Kim and Vale 2001). Typically, this involves the use of computer networks such as the Internet and digital stored value systems. The system allows bills to be paid directly from bank accounts, without being present at the bank, and without the need of writing and mailing cheques.

Cash Transaction/ Cash Usage

A cash transaction requires all aspects of a trade including delivery of payment to be finalized on the trade date. The settlement involves the use of physical cash (Agabonifo *et. al.*, 2012).

2.2 Theoretical Background

Two theories were adopted to serve as the theoretical framework for this work. The first is Diffusion of Innovation (DOI) Theory; the second is the Technology Acceptance Model (TAM). Diffusion of Innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Everett Rogers, a Professor of rural sociology, popularized the theory in his 1962 study on *Diffusion of Innovations*. He opined that diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. According to Rogers (1995), "five focal beliefs or constructs that influence the adoption of any innovation include- relative advantage, complexity, compatibility, trialability, and observability." Relative advantage indicates the usefulness of an innovation; Compatibility is the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of the potential adopter; Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use; Trialability construct is about trying out or testing an innovation so that it makes meaning to the adopter; and observability is the degree to which the results of an innovation are visible to others.

The Technology Acceptance Model (TAM), on the other hand was developed by Davis in 1986; it deals more specifically with the prediction of the acceptability of an information system. This model suggests that the acceptability of an information system is determined by two main factors: Perceived usefulness (PU) and Perceived ease of use (PEOU) (Park, 2009).

According to Davis (1989) Perceived Usefulness (PU)-was defined as "the degree to which a person believes that using a particular system would enhance his or her job performance"; while Perceived Ease of Use (PEOU) was defined as "the degree to which using a particular system would be free from effort".

However, relating the two theories to this research work; Perceived Usefulness (PU); Compatibility; Trialability and; Observability are seen from the perspective of factors which influence the decision of the users of the Electronic Payment System to use the technology and; Perceived Ease of Use (PEOU); Relative Advantage and; Complexity are viewed as the degree to which a person believes the Electronic Payment System would enhance service delivery. The DOI and TAM were used by Pikkarainen, Pikkarainen, Karjaluoto and Pahnila (2004), Hogarth, kolodinsky and Gabor (2008), Park (2009), and by Nwankwo and Eze (2013), among others.These theories are therefore relevant for this study.

2.3 Review of Related Empirical Studies

Recent investigations have shown that the benefits of e-banking are enormous. Several electronic channels available in United States were compared by Thornton and White (2001). They concluded that customer perception towards convenience, service, technology, change, and knowledge about the internet and computing affected the usage of different channels. Min and Galle (2004), observed that the disruption of access to information is a major reason why customers are unwilling to use the e-channels for transactions. White and Nteli (2004), viewed the situation differently and opined that customers like to interact with humans rather than machines. Howcroft, Hamilton and Hewer (2002), found that the most important factors encouraging consumers to use e-banking are lower cost followed by reduced paper work and human error, which subsequently minimize disputes as observed by Kiang, Raghu, and Hueu-Min Shang (2000). Agboola (2006), observed that the e-payment system has reduced the volume of cash transactions in the developed countries.

Using SWOT analysis, Ayo, Ekong, Fatudimu, and Adebiyi (2008), conducted an investigation on the level of adoption of ICT in the Nigerian Banking sector. It was found that all banks in Nigeria offer e-banking services and about 52% of them offer some forms of other online banking services. They also agreed that Nigeria was the fastest growing telecoms nation in Africa and the third of the world. They concluded that all banks in Nigeria engaged the use of ICT as a platform for effective and efficient delivery of banking services such as electronic payment cards with internet banking and mobile banking services gradually being introduced. Oladejo and Akanbi (2012), investigated e-banking and bankers perception in Nigeria. Findings showed that e-banking has brought about convenience, reduced customers' queue and minimized transaction cost. Nwaolisa and Kasie (2012), researched into electronic banking and users' acceptability in Nigeria. Their findings revealed that cash usage is still very high in Nigeria despite CBN's effort towards the adoption of the e-payment system. An investigation on bank employees' perceptions of the potential benefits and risks associated with electronic banking in Pakistan was conducted by Kaleem and Ahmad (2008). Their result suggest that bankers' in Pakistan perceive electronic banking as a tool for mitigating inconvenience, reducing transaction fees and saving time. Nwankwo and Eze (2013), examined electronic payment in cash-based economy of Nigeria: problems and prospects. Their findings showed that the electronic system of payment has a great implication in cash-based economy of Nigeria, but will lead to significant decrease in deposit mobilization and credit extension by Nigerian deposit money banks.

From the available literatures, there are lot of empirical studies on the electronic payment system and its adoption in Nigeria, but most of the studies concentrated on banker's perception of electronic banking in Nigeria and found that electronic banking is a tool for minimizing inconveniences, reducing transaction cost, altering customers queuing pattern and saving customers banking time (Agoola, 2006; Ayo, Ekong, Fatudimu and Adebiyi, 2008; Akhalumeh and Ohiokha, 2012; Oladejo and Akanbi, 2012).

This paper observes that, no specific study addresses the electronic payment system and cash usage. Thus, this study aim at examining the impact of Electronic Payment System on Cash Usage.

3.0 METHODOLOGY

3.1 Model Specification

A model was used for the purpose of this study. It was modeled towards examining the impact of the e-payment system on bank customers' cash usage and also for the purpose of testing whether a significant relationship exists between the e-payment system and customers' cash usage. This was subjected to the following model specification:

$$Prob.(CU_i = 1/EPS_i) = f(ATM_i, DC_i, MT_i, INTB_i)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

The equation (1) can be transformed into linear equation and thus becomes;

$$Prob.(CU_i = 1/EPS_i) = \beta_0 + \beta_1 ATM_i + \beta_2 DC_i + \beta_3 MT_i + \beta_4 INTB_i + e_i\dots\dots\dots\dots(2)$$

Where:

Prob. = Probability

CU_i = Cash Usage (Dependent variable)

EPS_i = Electronic Payment System (Independent variable).

Prob. (CU_i = 1/EPS_i) = probability of Cash Usage (CU) being equal to one (1) is conditioned on the Electronic Payment System (EPS).

And where proxies for EPS_i are: Automated Teller Machine (ATM_i), Debit Cards (DC_i), Mobile Transfer (MT_i), and Internet Banking ($INTB_i$).

β_0 = the intercept to the equation

$\beta_1, \beta_2, \beta_3$ and β_4 = the parameter estimates (coefficients)

e_i = the error term

The dependent variable is the Cash Usage represented by CU, while the independent variables (explanatory variable) are the Automated Teller machine (ATM), Debit Cards (DC), Mobile Transfer (MT) and Internet Banking (INTB). The data for this model was obtained from the responses on the questionnaire.

3.2 Model Estimation

In estimating the models, a dprobit regression, as well as Probit and Logit regression analysis were used to test the validity of the three models.

3.3   Sources of Data, Population, Sample Size and Sampling Technique

This study made use of the primary data which was obtained through the questionnaires administered. The questionnaire was a close-ended type, designed to seek definite responses from the respondents. The population for this study is the users of the e-payment system in the Ilorin metropolis of Kwara State. A sample size of five hundred (500) was selected from the users of the electronic payments system in Ilorin metropolis of Kwara State, using purposive sampling technique.

3.4   Method of Data Collection

The instrument for the collection of the primary data was the questionnaire designed and administered.

3.5   Method of Data Analysis

The data obtained for this study was subjected to dprobit, as well as probit and logit regressions, using the Statistical Package for Analysis (STATA 11.0). The descriptive statistics was also adopted, using percentile and drawing inferences.

4.0   RESULTS AND DISCUSSION

4.1   Factors Influencing the Adoption of Electronic Payment System by bank Customers

The Table 4.1 below shows the factors influencing the adoption of Electronic Payment System by the Nigerian bank customers'.

Table 4.1 Factors Influencing the Adoption of Electronic Payment System

Questions	Percent %
Do you find the e -payment platform to be user-friendly?	
Yes	71.15
No	28.85
Electronic Payment System has brought you convenience?	
Yes	88.89
No	11.11
Do you find the e -payment platform as useful?	86.75
Yes	13.25
No	
Do you find the e -payment platform as difficult to understand?	
Yes	33.12
No	66.88

Source: Author's Survey, 2013.

From the above Table 4.1, responses received shows that 71.15% of the respondents agreed that the e-payment platform is user-friendly and this perhaps resulted to the high adoption rate by the respondents. 88.89% of the respondents are also of the opinion that the Electronic payment System has brought convenience into their banking transactions. 86.75% are of the opinion that they find the e-payment platform as useful. As to whether customers' find the e-payment platform difficult to understand, only 33.12% agreed that the e-payment platform is difficult to understand. Perhaps these factors amounted to why bank customers have adopted the e-payment system as a medium of transaction.

4.2   Results of dprobit, Probit and Logit Regressions

4.2.1 Impact of Electronic Payment on Cash Usage

Variables	Marginal effect (dprobit)	Probit	Logit
CONSTANT			
Coefficient		-0.3055993	-
Prob. (z-stat)		0.014**	0.5119056
Robust std. Err.		0.1243536	0.011**
			0.201037
ATM			
Coefficient	-0.1494053	-0.4097088	-
Prob. (z - stat)	0.087*	0.087*	0.6514283
Robust std. Err	0.0833327	0.2393699	0.090*
			0.3847701
DC			
Coefficient	0.3300148	0.8627161	1.389185
Prob. (z - stat)	0.000***	0.000***	0.000***
Robust std. Err	0.869227	0.2353125	0.3798253
MT			
Coefficient	0.1374987	0.3637629	0.6127102
Prob. (z - stat)	0.003***	0.003***	0.002***
Robust std. Err	0.0453799	0.1212991	0.1988795
INT.B			
Coefficient	0.0963795	0.2545824	0.4319442
Prob. (z - stat)	0.042**	0.042**	0.034**
Robust std. Err	0.0472585	0.1254303	0.203501
Pseudo R2	0.0659	0.0659	0.0667
Wald chi 2 (4)	37.61	37.61	35.61
Prob. Chi 2	0.0000***	0.0000***	0.0000***

***significant at 1%, **significant at 5%, *significant at 10%.
Source: Author's computation (2014)

The coefficients of the marginal effect regression (dprobit) indicates that a unit increase in the use of the Automated Teller Machine decreases the likelihood of customers' cash usage by -0.1494053 i.e., decreases customers cash usage by approximately 15%. The 0.3300148 coefficient for Debit Card indicates that a unit increase in the use of debit card by bank customers increases the likelihood of customers' cash usage by 33%.

The 0.1374987 coefficient for the Mobile Transfer facility implies that a unit increase in the use of the facility increases the probability of customers' cash usage by 13.75%, while a unit increase in the use of Internet Banking has the probability of increasing customers' cash usage by 9.63%.

The probabilities of the z-statistics for Debit card, Mobile Transfer, and Internet Banking are 0.000, 0.003 and 0.042, and shows that both Debit Card and Mobile Transfer are statistically significant at 1% level of significance, while the Internet Banking is statistically significant at 5% level of significance. The ATM is statistically significant at 10% level of significance.

The Wald Chi-square (Wald Chi ^{2} (4)) = 37.61 is large with an associated probability of 0.0000 i.e., Prob. Chi ^{2} = 0.000 indicating that the model is statistically significant at 1% level of significance.

Results from the Probit regression show that three out of the four predictors (Debit Card, Mobile Transfer and Internet Banking) of the model all have positive coefficients. The coefficient of the Debit Card is 0.8627161, Mobile Transfer is 0.3637629 and Internet Banking is 0.2545824. These positive coefficients imply that the likelihood of customers' cash usage increases with the use of Debit Card, Mobile Transfer and Internet Banking respectively. The coefficient of the Automated Teller Machine is -0.4097088, and implies the likelihood that customers' cash usage will decrease with the use of ATM. The coefficient of the constant variable is -0.3055993 and implies that customers' cash usage is likely to decrease constantly by -0.8754835 with the use of the electronic payments system.

The probabilities of the z-statistics for the Debit Card, Mobile Transfer, Internet Banking and the constant are 0.000, 0.003, 0.042 and 0.014 respectively. This implies that both Debit Card and Mobile Transfer are statistically significant at 1% level of significance, the Internet Banking and the constant variable are statistically significant at 5% level of significance, while the ATM is statistically significant at 10% level of significance.
The Wald Chi ^{2} (4) is 37.61 with a probability of 0.0000. This implies that the model is statistically significant at 1% level of significance. The figure in parentheses indicates the four predictors (ATM, Debit Card, Mobile Transfer and Internet Banking) used in the model.

The results from the Logit regression indicate positive coefficients of 1.389185, 0.6127102, and 0.4319442 for Debit Card, Mobile Transfer and Internet Banking respectively. This implies that the probability of cash usage increases with the use of the Debit Card, Mobile Transfer and Internet Banking. The coefficient for ATM is negative with a value of -0.6514283 and implies the probability of cash usage decreases with the use of ATM.

The constant variable has a negative coefficient of -0.5119056 and implies that customers' cash usage is likely to decrease constantly by -1.586667 with the use of the electronic payments system.

The associated probabilities of the z-statistics for Debit Card, Mobile Transfer, Internet Banking and the constant variable are 0.000, 0.002, 0.034, and 0.011 respectively. This implies that both the Debit Card and Mobile Transfer are statistically significant at 1% level of significance, the Internet Banking and the constant variable are statistically significant at 5% level of significance, while the ATM is statistically significant at 10% level of significance.

The Wald Chi ^{2} (4) is 35.61 with an associated probability (Prob. Chi 2) of 0.0000, implying that the model is statistically significant at 1% level of significance.

Applying the theories adopted by this research work in discussing the findings of this study; the Diffusion of Innovation theory and the Technology Acceptance model are two similar theories on technology adoption with five and two constructs respectively. The findings of this research work that factors influencing the adoption of the electronic payment system are its user-friendliness, convenience, usefulness and ease-of-use (non-difficulty to understand), as well as the findings on benefits of the electronic payment system which include reduced risk of cash related crimes, cheaper access to out-of-branch banking services as well convenience in conducting banking transaction are all in conjunction with the constructs provided by the two theories. The findings of this research work is therefore consistent with the findings of Rogers (1995); Pikkarainen, Pikkarainen, Karjaluoto and Pahnila (2004); Hogarth, kolodinsky and Gabor (2008); Park (2009); and Okafor and Ezeani (2012).

5.0 CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, we therefore recommend that: (i) the Central Bank of Nigeria (CBN) being a supervisory and regulatory body concerned should embark on public enlightenment on the use of e-settlement platform; (ii) It should specifically put in place a policy on 'e-transact' to enable more Nigerians adopt the use of the electronic payment system before going fully into a cashless economy. This is because the cashless policy which the CBN has recently introduced cannot thrive or work without customers first embracing the e-payment facilities. This study concludes that if the above recommendations are implemented, more users are likely to adopt the e-payment technology, which will in-turn reduce customers' cash usage, and subsequently impact positively on the Nigerian financial system.

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