



IMPACT OF POS MACHINE ON FINANCIAL INCLUSION: EVIDENCE FROM KADUNA METROPOLIS DATA.

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ABSTRACT

The survival of any nation economy is tied to the growth of financial inclusion. Thus, globally there is a need for continuous supply of economical financial services and product that will bring the helpless (poor) individuals into the formal financial economy services. This study adopted diffusion of innovation theory of Everett Rogers and transaction cost innovation theory of Licko and Niehans to test the impact of POS on financial inclusion, using cross-sectional approach in which data were collected during the study period. Data were source from 384 people in Kaduna metropolis. The study used positivism research paradigm and adopted quantitative methodology. Data from this study were analyzed using PLS- SEM. Finding from the study revealed that, POS significantly impact Accessibility and Usability, but has no significant impact on Quality. The findings of this study give support to the hypothesized relationship between the dependent and independent variables. The research study found that, POS has a significant impact to enhancing accessibility, quality and usability in Kaduna metropolis. Therefore, it is recommended that, dissemination of information about the digital financial products and services is necessary, information such as how to use the digital financial products and services, it benefit and also to make the digital financial product and services more accessible and also to upgrade the quality of digital product and services so as to increase the usability of such product and services.

Keywords: Financial inclusion, POS, Nigeria, Kaduna State metropolis.

INTRODUCTION

The growth and survival of any nation economy depend on the good functioning of its financial institutions. It is widely claimed that, Financial inclusion has a very good effect for financial stability by lowering pro-recurring risk, and a significant raise in the amount of small savers via super financial inclusion system would uplift both the amount and stability of the deposit base of banks which would lower banks' over reliance on non-core financing, and turned to be more elastic during banking crisis, thus increasing banking system stability (Khan, 2011). However, World Bank (2012) sees financial



inclusion as the ambit or attribute and accessibility of financial services and products to the underserved or disadvantage financially eliminated populace. Beside, Hannig and Jansen (2010), find that, financial organisations that provide financial services to low cash flow individual firms likely to endure through macro-crises well and aid local economic venture and economic development. Moreover, according to Kaduna State Government (2021), the state's policy on financial inclusion will encourage opportunities to bring financial inclusion to the 55% of individual adults that are presently unbanked or financially excluded, and this is achievable through the use of financial technology.

Point of Sale (POS): These represent the computerization of the cash register and its link to database and therefore, rendering businesses with more digital data and the capacity to know them. POS is an agent banking services which supplies financial services self-reliant of the usual bank branches (EFInA 2014). However, POS systems give businesses the ability to retain and analyses a wide variety of transaction data on a continuous basis (Abu-Musa, 2004). Besides, businesses set up POSs near store exits to increase the rate of desire purchases of goods and services for customers within or outside (Hayes, Estevez, & Jasperson, 2020). Besides, Sanusi Lamido (2010) suggested that, economic advancement would be achieved at a speedy rate if all portions of the individual populace have access to digital financial services. Also Emefiele (2017) revealed that, DFS has the potential to add about 46 million Nigerians into the formal financial system by 2025. However, despite the availability of digital financial service (DFS), according to Enhancing Financial Innovation and Access (EFInA, 2020), in Kaduna State about 38% of it adult populations are financially included and only 28% are actively user of digital store of value i.e. out of 1.5m financially included persons. It is in light of the above that, this research study is set out to investigate the impact of POS on financial inclusion: A study on Kaduna metropolis. In order to achieve the objectives of this study the following hypothesis were proposed;

H01: Point of Sale (POS) has no significant impact on accessibility of financial products and services in Kaduna metropolis.

H02: Point of Sale (POS) has no significant impact on usability of financial products and services in Kaduna metropolis.

H03: Point of Sale (POS) has no significant impact on quality of financial products and services in Kaduna metropolis.

LITERATURE REVIEW

POINT OF SALE (POS)

Point of Sale (POS): is an agent banking services which supplies financial services self-reliant of the usual bank branches (EFInA, 2014). However, POS systems give businesses the ability to retain and analyses a wide variety of transaction data on a continuous basis (Abu-Musa, 2004). Besides, different business's location set up POSs their store exits to increase the rate of desire purchases of goods and services for customers within or outside (Hayes, Estevez, & Jasperson, 2020).

Additionally, the Electronic Transmission of Prescriptions (2015) maintained that, the POS are very important focus for businesses because people tend to make buying decisions on high-margin products or services at these strategic locations ETF (2015).

DIMENSION OF POS

MOBILE MONEY WALLETS: *refers to an application on a device (i.e. mobile device) which can firmly or tightly relate with digital store of value (Mobey Forum, 2011).* For instance, POS mainly consists of a phone app that attaches to a card reader.



E-wallet: This is seen as a kind of E-wallet which is used for online business dealings with the help of smartphones device or a computer device, its services is not different from that of debit cards and credit cards. For instance, Economic Times (2018) argued that, E-wallets have to be connected with those People who have account with financial institutions. For example, with an online POS you can use your own hardware, which might be a PC or tablet.

Branchless banking: This is a technological innovation such as card reading point of sales (POS), mobile phones or smartphone devices used by either retail banking agent, third party intermediaries or personal phones or computer devices, to deliver financial services to individual firms out of the traditional bank branches for business dealings Consultative Group to Assist the Poor (United Nations. (2016).

FINANCIAL INCLUSION

Financial inclusion: this brings about bank saving which rises countries' net saving as well as raises national investment and usage. For instance, bank saving is an essential tool that enhances families or groups of individuals firms capability to absorb any internal or external financial shocks, clear usages, and gather asset and investment on individuals capabilities such as; education, health and human or individuals development or growth Dupas & Robinson (2013). However, financial inclusion aids to reduce the gender inequality in developing country and society. For example Prina (2015), conducted a research study base on the female individual's household of Nepal and found that, accessibility to bank savings account increases monetary assets and total assets to around 16%.

Similarly, Brune et al, (2015), carried out a field experiment among cash crop individual household farmers in Malawi and discovered that, provision of accessibility to bank saving account not only raise banking activities but also has a significant and economic effect on individuals household farmers well beings such as; investments in agricultural facilities or inputs and ensuring agriculture produce.

The characteristics/ dimensions that form financial inclusion are: Accessibility, Usability and Quality of financial products and services.

Accessibility: Refers to the capacity to make the use of accessible financial services and products from established or formal financial institutions Hannig and Jansen (2010) and Serrao et al (2012).

Usability: is the efficacy and enhancing of financial service and products used Jansen and Hannig (2010) Serrao et al (2012). It is also the performance and deepening (depth) of financial service and product used Jansen and Hannig (2010) Serrao et al (2012). For instance, the amount of commercial bank account used in any financial dealings such as payment or remittance, loan/credit, commercial bank saving account, insurance service, pension etc. for at least once in 90 days.

Quality: This refers to the applicability of financial service or product to the lifestyle wants of the individuals' users Serrao et al (2012) and Hannig and Jansen (2010). Moreover, (Bitner, 1990; Headley and Miller, 1993; Zeithaml, Berry, and Parasuraman, 1996), Distribution of high financial quality services brings about high individual customers contentment and patriotism and high readiness to prescribe lessen individual customers' complaints about products and services and a high raise in individual user retention rates to the highest stage. Presently, scholars and specialist have given more mind to service quality as it is presumed that service quality is an important measure of individual firm's achievement (Lasser, Manolis, and Winsor, 2000; Yavas and Yasin, 2001; Bick, Brown, and Abratt, 2004; Andreassen and Olsen, 2008).



REVIEW OF EMPIRICAL STUDIES

Stephen and Sibert (2014) conducted research on the impact of mobile banking on financial inclusion in Zimbabwe: A Case for Masvingo province. The findings revealed that, the low income people are willing to adopt mobile banking and the reasons are that, it is easily accessible, convenient, cheaper, easy to use and secure. The identified gap in this research is that, the research case study is Masvingo province not Kaduna metropolis.

Agada and Meysam (2016) carried out a research study to examine the impact of information and communication technology service quality on customer satisfaction in Nigeria banking sector. Convenience sampling technique was utilized to gather quantitative data. The outcomes of the result found that, ICT innovation improve service quality. Therefore, the identified gap in this research study is that, the research talks so much on ICT Innovation without making a reference to POS.

Ameme and Wireko (2016) carried out a research study which studied customer satisfaction and the associated cost of electronic banking services with specific reference to banking customers in Ghana. The research findings revealed that the cost associated with technological innovation in the banking has also increased transactions costs to the disadvantages of customers. However, the identified gap in this research study is that, the research talks so much on electronic banking service without making a reference to POS.

Research conducted by Lasisi and Abubakar (2014), on an empirical study of automated teller machine (ATM) and user satisfaction in Nigeria: A study of united bank for Africa in Sokoto metropolis. The findings revealed that, the impact of ATM services in terms of their perceived ease of use, transaction cost and service security is positive and significant. The research was done in Sokoto metropolis not in Kaduna metropolis.

Ilo, Ani and Chioke (2014) carried a research study which studied the impact of technological innovation on delivery of banking services in Nigeria using the instrument of questionnaire for data collection. The outcome of the result findings revealed that a positive relationship exist between technology innovation and bank employee's performance. It also revealed that the introduction of ICT improves customer satisfaction and retention and there is a significant relationship between technology innovation and service delivery. However, the identified gap in this research is that, the research talks so much on ICT service without making a reference to POS.

Research conducted by Kangni and Mihasonirina (2012), on Mobile Phones, Financial Inclusion, and Growth. The findings of this paper underline the importance of mobile phone rollout for African countries. The identified gap in this research is that, the research talks so much on the economic growth through better financial inclusion with reference to mobile phones without considering the point of sale (POS) device in the first instance.

UNDERPINNING THEORIES

The theories and framework or models on invention or innovation acceptance which edify this research are: **Diffusion of Innovation Theory** of Everett Rogers (2003) and transaction cost innovation theory of Ilicks and Niehans (1983).



DIFFUSION OF INNOVATION THEORY

Diffusion of invention or innovations theory was suggested by Everett Rogers in (2003). The theory tries to analyses why, how and at what grade new concepts and technology expands. According to Rodgers (2003), diffusion is the means or procedures in which a creation or innovation is disseminated beyond the regular time among the players in a social process. Rogers (2003), proposed five characteristics in the theory of invention or innovation which includes the followings: First characteristic which is relative advantage show the extension of technological creation or innovation beyond the old, former or previous creation or innovation. Second characteristic is compatibility. Compatibility is the fitness of technological invention or innovation with the acceptance wants or needs, acceptance exposure, and acceptance value. The third characteristic is complexity which refers to the level of complication or difficulty of understanding and the use of technological creation or innovation. The fourth characteristic is trialability which refers to the level in which financial creation or innovation can be tested and trusted. The fifth characteristic is observability which means the level in which the outcome of acceptance of technological invention or innovation is noticed and informed.

THE TRANSACTION COST INNOVATION THEORY

The transaction cost invention or innovation theory's main innovators are: Hicks and Niehans in (1983). However, according to Hicks and Niehans (1983), argued that, the main cause of financial invention or innovation is the cost reduction in transaction dealings and in reality, advancement in technology is the cause of financial technological creation or innovation and this innovation leads to cost reduction in transaction dealings in financial institutions.

RESEARCH METHODOLOGY

This research study employed quantitative research technique. Data was collected using cross-sectional approach in which data were collected during the study period. Again, the data collected was analyzed and explained statistically upon which conclusions was drawn, and significant inferences about the population of the research study were equally made at a point in time. In addition, the reason for the use of cross-sectional design approach above other research design (for example longitudinal research design) was due to its time and money-saving, cost-effective (Punch, 2005; Saunders, Lewis, and Thornhill, 2009; Sekaran and Bougie, 2010; Wilson, 2010). However, PLS-SEM was used to test the proposed hypothesis. The populations of the study are 5, 55,000 respondents who represent financial included person's in Kaduna metropolis. The research study hold sample size of 384 respondents from the four LGAs. The local governments hold Kaduna North, Kaduna South, Igabi and Chukun in Kaduna metropolis. The reason for chosen Kaduna metropolis is due to the heavy population density, as well as high concentration of electronic banking services in the metropolis. Thus, the sample size of this research study was determined through Krejcie and Morgan population/sample determinant table (1970). The researcher asked the respondents viewpoint on 5 point Liker scale score, ranging from 1 strongly disagreed to 5 strongly agreed on score such as "My bank's POS is accessible beyond regular business hours". Items operationalized to measure POS were rated based on 5 points Liker scale. Here the answerer are require to voiced their level of disagreement, agreement or neither agree not that is (1 strongly disagreed and 5 strongly agreed) and questions Such as "You are satisfied with the current POS services of your bank" were asked.

The determination of the number of respondents for each of the LGAs was done proportionately as follows:



$$\text{No of Respondents} = \frac{\text{Population of each LGA}}{\text{Total population of the 4 sample LGAs}} \times \text{sample size}$$

The determination of the number of respondents for each of the sample four (4) LGA was done proportionately below as follows.

Table 1 Sample size distribution of financial inclusion in the Kaduna State metropolis

Kaduna Metropolis	No. of financial inclusion	Percentage of Sample size	Sample size
Kaduna North	1,50,000	$1,50,000/5,55,000 \times 384 = 104\%$	104
Kaduna South	1,65,000	$1,65,000/5,55,000 \times 384 = 114\%$	114
Igabi	1,35,000	$1,35,000/5,55,000 \times 384 = 94\%$	94
Chuku	1,05,000	$1,05,000/5,55,000 \times 384 = 73\%$	73
Total	5,55,000		384

Source: Researcher survey (2023)

RESULTS AND DISCUSSION

This section shows the descriptive statistics involving minimum, maximum, mean, and standard deviation for items in the constructs. Moreover, answerers' responses were collected on Likert scale with supports from 1 to 5, where 1 is strongly Disagree and 5 is strongly Agree. Besides, Table 1 present the descriptive analysis for POS, QTY, ACC, and USG.

Table 1 Descriptive Statistics for POS, QTY, ACC, and USG.

		Minimum	Maximum	Mean	Std. Deviation
Point of Sale	POS	1	5	3.81	1.09
Quality	QTY	1	5	3.68	1.05
Accessibility	ACC	1	5	3.91	0.98
Usability	USG	1	5	3.98	0.92

Source: Researcher's computation

From the above Table 1, the mean score and std. deviation of the constructs or latent variables (POS, QTY, ACC, USG) range from 3.68 to 3.98 with a standard deviation ranging from 0.92 to 1.09 respectively. In specific, the independent variable POS had a minimum value of 1 and maximum value of 5 with mean value of 3.81 which is the same with the scale of four (4) agree and std. deviation of 1.09 which depict variance of one (1) respectively. However, this shows that, majority of the respondents are of the opinion that POS services is satisfactory. Furthermore, regarding the dependent variables, QTY, ACC and USG in Table 1, had a minimum value of 1 and maximum value of 5 with a given mean value of 3.68, 3.91 and 3.98 which are the same with the scale of four (4) agree and std. deviation of 1.05, 1.98 and 0.92 which depict variance of one (1) respectively. Though, this shows that, majority of the respondents are of the opinion that there is accessibility, quality, and usability of services.

ASSESSMENT OF MEASUREMENT MODEL

Measurement of outer model analysis the relationships between the indicators and their respective constructs or latent variables (Hair et al., 2014; Henseler, Hubona, & Ray, 2016; Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016). However, in this research study, the measurement model has been appraised based on its reliability and validity. Besides, using the PLS-SEM as statistical means for the present study, the measurement scales accepted evaluates individual indicator reliability, internal consistency reliability, convergent validity and the discriminant validity of the indicator or construct relations. Figure 1 and Table 2 shows the measurement model.

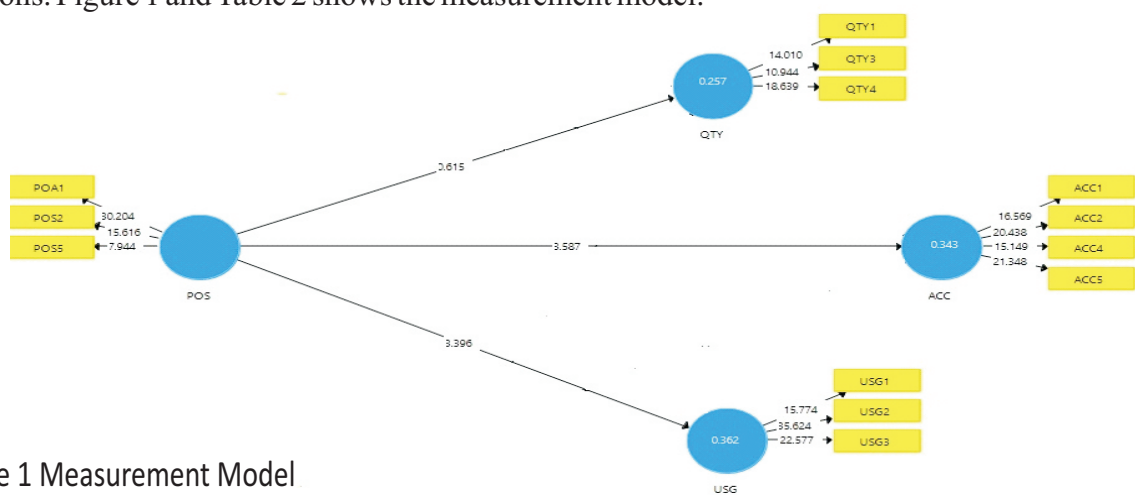


Figure 1 Measurement Model

Table 2 Measurement Model Results

Construct and Indecators	Loadings	Composite Reliability	Average Variance extracted (AVE)
Accessibility			
ACC1	0.691	0.809	0.515
ACC2	0.762		
ACC4	0.711		
ACC5	0.702		
Point of Sale			
POS1	0.840	0.763	0.524
POS2	0.747		
POS5	0.556		
Quality			
QTY1	0.711	0.768	0.525
QTY3	0.693		
QTY4	0.768		
Usage			
USG1	0.764	0.822	0.607
USG2	0.825		
USG3	0.745		

Source: Researcher's computation

From the above Table 2, individual indicator reliability was measured by studying the outer loadings of the latent variable (Byrne, 2004; Hair, Ringle, & Sarstedt, 2014; Hulland, 1999). The standard range values of 0.5 to 0.7 are the acceptable values for indicator reliability proposed by Byrne (2004) and Hair, et al., (2014). Thus, from Table 2 above the outcome of the loading of the 13 items fall between the range 0.5 and 0.8 this exceeded 0.7 as the threshold which is satisfactory. Secondly, the threshold for Cronback's Alpha and composite reliability result is 0.70 or higher as suggested by Baggozzi (1988) and Hair et al (2014), in this research study the composite reliability coefficient approach was used to evaluate the internal consistency reliability and the result of the composite reliability for each construct or latent variable in Table 2 above falls within the range 0.763 to 0.822, which is above the standard minimum threshold of (0.70) which is satisfactory. Thirdly, Convergent validity was verified using the average variance extracted (AVE) Fornell & Larcker, (1981) hold that, the threshold for AVE should be at least 50% (0.5) and in Table 2 above, all the AVE exceeded 0.5 which is satisfactory. Fourthly, this present study used *Fornell-Larcker Criterion (1981)* to ascertain discriminant validity see Table 3 below.

Table 3 Results of Discriminant Validity Test (Fornell -Larcker Criterion)

	ACC	POS	QTY	USG
ACC	0.717			
POS	0.451	0.724		
QTY	0.399	0.293	0.725	
USG	0.585	0.438	0.386	0.779

Source: Researcher's computation

Discriminant validity as presented in Table 3 above shows that, discriminant validity values were achieved, because the square root of the AVEs were higher and greater than the correlation between the latent or constructs variables which is satisfactory.

STRUCTURAL MODEL

After reviewing the standard of the measurement model, this section advanced to the assessment of structural model. However, inner model or structural model as the name implies, shows the relationship among the theoretical constructs or latent variables (Chin, 1988; Sarstedt et al., 2016). Though, as revealed by current literature on PLS path modeling, the current research study shows the outcome of the results of the inner model through measuring the significance and relevance of the structural path coefficients and the level of R-square (coefficient of determination) (R^2). Therefore, Figure 2 and Table 4 below show the conclusions of the full structural model for this research study.

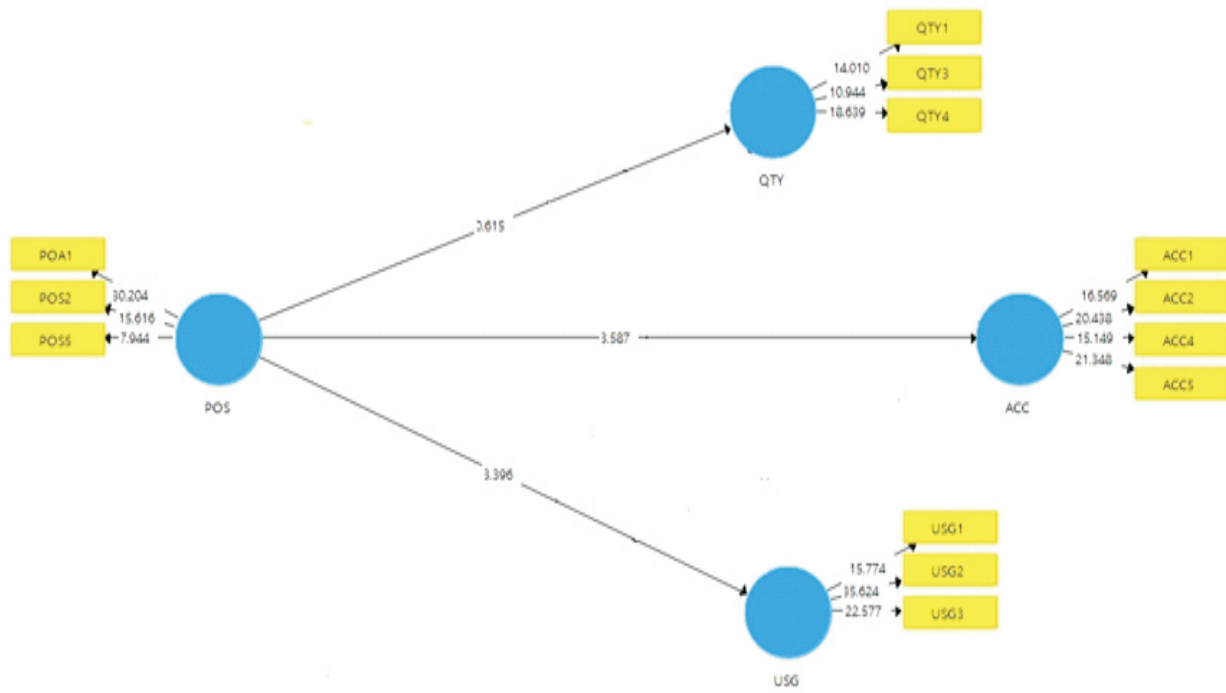


Figure 2 Structural Model

SIGNIFICANCE AND RELEVANCE OF THE STRUCTURAL PATH COEFFICIENTS

The structural model, modeled relationship i.e. the path coefficients represent the hypothesized relationship among the latent variables or constructs. However, the acceptable value of the path model is between -1 and +1 (Hair et al., 2014). From figure 2 above, the arrows value connecting the independent latent variable to the dependent latent variable (i.e. QTY, ACC and USG represent the T-values. The outcome of the result show significant relationship between all the variables based on the significance level of 5% (0.05) error probability and critical t-value of 1.96 in respect of two-tailed test. Thus, pointing out to significance of the structural path coefficients of hypotheses postulated for the present research study, the results of each significance and their findings are presented in Table 4

Table 4 Results of Structural Model

Hypothesis	Relationship	Beta	SE	t-value	p-value	Findings
H1	POS -> ACC	0.225	0.063	3.587	0.000	Not Supported
H2	POS -> QTY	0.038	0.061	0.615	0.539	Supported
H3	POS -> USG	0.183	0.054	3.396	0.001	Not Supported

Source: Researcher's computation

Based upon the theoretical framework of the research study, Three (3) hypotheses were posited out of which only two (2) were statistically significant. However, it could be recalled at the beginning that, Hypothesis 1 predicted that, POS has no significant impact on ACC. Therefore, as indicated in Figure 2 and Table 4, there exist a significant impact between POS and ACC. That is, ($\beta = 0.225$, $t = 3.587$, $p < 0.05$). Consequently, Hypothesis 1 not supported. Conversely, Hypothesis 2 predicted that, POS has no significant impact on QTY. Still, as indicated in Figure 2 and Table 4, there exist no significant impact between POS and QTY. That is, ($\beta = 0.038$, $t = 0.615$, $p > 0.539$). Thus, Hypothesis 2 supported. Lastly, Hypothesis 3 predicts that, POS has no significant impact on USG. However, as indicated in Figure 2 and Table 4, there exist a significant impact between POS and USG. That is, ($\beta = 0.183$, $t = 3.396$, $p < 0.05$). Thus, Hypothesis 3 not supported.

ASSESSING THE LEVEL OF R-SQUARE (R²)

Evaluating the R-square level also point out testing the coefficient of determination. However, the outcome of the variance is said to range between 0 and 1, with value closer to 1 indicating high level of predictive certainty and vise-versa. Therefore, Falk and Miller (1992) proposed that, for variance explained for a particular dependent (endogenous) contracts to be seen as sufficient, R-square value should be equal to or higher than 0.10. Thus, as shown in Table 5 below, the R-square value for the main outcome of the PLS model was 0.343, 0.257, and 0.362. Though, this proposed that, the independent (exogenous) variables for this study collectively explained 34% (34% adjusted), 26% (25% adjusted), 36% (36% adjusted) of the variance in ACC, QTY and USG.

Table 5 Results of Variance Explained - Coefficient of Determination

	R Square	R Square Adjusted
ACC	0.343	0.338
QTY	0.257	0.251
USG	0.362	0.357

Researcher's computation

CONCLUSION AND RECOMMENDATION

This study has contributed to literature on financial inclusion in the context of Kaduna State metropolis. Generally, the findings of this study give support to the hypothesized relationship between the dependent and independent variables. The research study found that, POS has a significant impact to enhancing accessibility, quality and usability in Kaduna State metropolis. Therefore, it is recommended that, dissemination of information about the digital financial products and services in Kaduna metropolis by the financial institution is necessary, information such as how to use the digital financial products and services, it benefit and also to make the digital financial product and services more accessible and also to upgrade the quality of digital product and services so as to increase the usability of such product and services.



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