



IMPACT OF FINTECH ON FINANCIAL INCLUSION: A STUDY ON KADUNA METROPOLIS.

By

HASSAN ISAH YAHAYA

Ahmadu Bello University, Zaria. Nigeria

And

LAWAL MUHAMMAD KABIR

Ahmadu Bello University, Zaria. Nigeria

And

ABUBAKAR ABDULKAREEM

Kaduna State University. Kaduna Nigeria

And

HUSSAINI ISA

Ahmadu Bello University, Zaria. Nigeria

ABSTRACT

Financial Inclusion plays an important role in the economic growth and development of any nation through the provision of a wide range of availability, accessibility of financial products and services to the poor individuals, low-income households, this study used diffusion of innovation theory of Everett Rogers and transaction cost innovation theory of Hicks and Niehans to test the impact of fintech on financial inclusion. The study adopted positivism research paradigm and collected quantitative data using survey research approach and self-administered questionnaire. Data were source from 384 financially included persons in Kaduna metropolis. The collected data was analyzed using PLS. Finding from the study revealed that, Automated Teller Machine, Point of Sale and Debit Card significantly impact Accessibility and Usability, and also Automated Teller Machine and Debit Card has significant impact on Quality, while Point of Sale has no significant impact on Quality on financial product and services. The study recommends that, the financial institution in Kaduna State metropolis should create positive impact on educating and enlightening the financially included populace in Kaduna State metropolis about the digital financial products and services, how to use it, its economic benefit and also to make the financial product and services more accessible and also to improve quality of service so as to improve the usability of such product and services in Kaduna State metropolis.

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

INTRODUCTION

Globally, financial inclusion is very important to the economic growth and development of any nation. Financial inclusion provides low-cash flow individual firms with the prospect to save for the future unanticipated conditions which promote stableness in personal finance, increase in the use of bank deposits which leads to solid and stable bank deposit base for financial institution during the period of distressed Han and Melecky (2013). Similarly, Kama and Adigun (2013), opined that giving financial access to the hundreds of millions of individual firms all over the globe who are currently financially



eliminated would render the possibilities for the formation of a large depository of bank savings, investable capital, investment financing and thus universal wealth creation. Moreover, according to Kaduna State Government (2021), the state's policy on financial inclusion encourages opportunities to bring financial inclusion to the 55% of individual adults that are presently unbanked or financially excluded.

Fintech is the use of fresh or new technology and inventions with other obtainable business individual firms in order to face the notion of traditional financial systems and intermediaries in sharing of financial products and services (Chishti and Barberis, 2016). 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, digital financial services have the potential to add about 46 million Nigerians into the formal financial system by 2025. Despite the provision of available digital financial services (DFS) in Nigeria, in Kaduna State about 38% of adult populations are financially included and only 28% are actively user of digital store of value that is out of 1.5m financially included persons Enhancing Financial Innovation and Access (EFInA, 2020). It is in light of the above that, this research study is set out to investigate the impact of fintech on financial inclusion: A study on Kaduna metropolis. In order to achieve the objectives of this study the following hypothesis were proposed;

- H01: Automated Teller Machine (ATM) has no significant impact on accessibility of financial products and services in Kaduna metropolis.
- H02: Automated Teller Machine (ATM) has no significant impact on usability of financial products and services in Kaduna metropolis.
- H03: Automated Teller Machine (ATM) has no significant impact on quality of financial products and services in Kaduna metropolis.
- H04: Point of Sale (POS) has no significant impact on accessibility of financial products and services in Kaduna metropolis.
- H05: Point of Sale (POS) has no significant impact on usability of financial products and services in Kaduna metropolis.
- H06: Point of Sale (POS) has no significant impact on quality of financial products and services in Kaduna metropolis.
- H07: Debit Card (DC) has no significant impact on accessibility of financial products and services in Kaduna metropolis.
- H08: Debit Card (DC) has no significantly impact on usability of financial products and services in Kaduna metropolis.
- H09: Debit Card (DC) has no significantly impact on quality of financial products and services in Kaduna metropolis.

LITERATURE REVIEW

FINTECH

Fintech: this covers a degree of new financial products and financial services, financial business dealings, finance associated software, and different or various forms of individual customers financial delivery and communication channeled (Gomber, Koch, and Siering (2017). Also, is a financial product and financial services that are apportioned or channel via the use of computer equipment's,



mobile devices or phones, personal computers equipment, the internet or electronic cards, associated with reliable digital payment channels (Gomber, Koch, and Siering (2017). Financial technology is seen or described as the combination of financial market services such as; savings, deposit, payment, remittances and management of funds with information technology (Lee and Kim, 2015).

DIMENSION OF FINTECH

Mobile Money Wallets: *refers to an application on a device (i.e. mobile phones) which can firmly or tightly relate with digital store of value (Mobey Forum, 2011).* Also, Mobile wallet is a functional application which is downloaded on a device that is (mobile phone), which store the money value and allowed individual customer to make financial dealings online with the help of a mobile phones or device (Sarika Prabhakaran and Dr Vasantha Shanmugam 2020; Singh et.al.2017; Madan and Yadav,2016).

E-wallet: is a channel that allowed individual firms to carry out business dealings through the use of application software's, smartphones device, or online services. E-wallet is an electronic wallet which services is not different from that of debit cards and credit cards with the help of smartphones device or computer devices for online business dealings(CFI (2015), for example, Ali pay, pear to pear, inters witch etc Uduji, J.I., et al. (2019).

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 United Nations. (2016). Branchless banking is a financial institutions establishment that rendered financial products and services outside the conventional banking institutions, it serve as a new distribution channels Timothy R. Lyman, GautamIvatury, Stefan Staschen (2006). Also, Branchless banking is the provision or distribution of financial products and services to individual firms regardless of commercial bank branches in order to carry out financial business dealings without reaching any bank branches Khanan (2008).

FINANCIAL INCLUSION

Financial inclusion: refers to having access to formal financial products and services, it is the ambit or attribute and accessibility of financial services and products to the underserved or disadvantage financially eliminated populace (World Bank (2012). Also, is a continuous supply of economical financial services and product that bring the helpless (poor) individuals into the formal financial services (United Nations Report, 2016). However, with an increase in financial inclusion, poor individual firms who were previously financially eliminated will be able to invest in education, save and launch businesses enterprises, and this will contribute to poverty step-down and economic development and growth (Beck et al., 2007; Bruhn and Love, 2014).

DIMENSION OF FINANCIAL INCLUSION

Accessibility of Financial Product and Services: it is the extension of banking products, services and agents across different division sectors or environments such as; barber shop, filling stations, electronics shops, grocery shops, gas stations, postal services, pharmacies stores, and institutions such as schools etc.; as long as they are business enterprises that involves in managing cash Camara et al. (2015). It also 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 Serrano el at (2012).



Usage of Financial Product and Services: referred to as the degree to which the available formal financial services and products are embraced and repeatedly used by individual firms to satisfy their immediate daily financial wants (Maheswari, 2016; Ghosh, 2019). It also means the efficacy and enhancing of financial service and products used Jansen and Hannig (2010) Serrao et al (2012). For instance, total number of bank accounts used in any financial dealings such as bank loan/credit, bank saving, remittance, insurance, retirement savings that is (pension).

Quality of Financial Product and Services: This refers to how well the financial products and services fit with the wants of users such as quality of products and services that is, client value, core tenets of consumer protection, pricing, and financial capacity such as literacy. It is the applicability of financial service or product to the lifestyle wants of the individuals users Serrano et al (2012) and Hannig and Jansen (2010). For instance,

REVIEW OF EMPIRICAL STUDIES

Tabitha and Sella (2019), conducted a research on the digital finance and its impact on financial inclusion. The findings of the study found that Usability, Convenience, Accurate timing, and easy interbank account facility has positive impacts on Mobile banking, Low service charge and accurate timing has significant impacts on mobile wallets (apps) even Low service charge also has positively impacted on the credit card. Therefore, the identified gap in this research is that the research talks so much on Internet banking, Mobile banking, Mobile Wallets Application (apps), Credit card and debit card with special reference to mobile banking, mobile wallets (apps), and credit card, without considering automated teller machine in the first thought.

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 talks only about mobile banking without considering automated teller machine in the first instances.

Michael (2018), conducted research on the nexus between internet penetration and financial inclusion in Nigeria. The findings revealed that, internet penetration has significant impact on financial inclusion in Nigeria. The identified gap in this study is that, the study says much on internet penetration for online financial services which is costly because it needs internet service to carry out financial dealings without a regards to debit cards (DC).

Sunday (2018), conducted research on the empirical assessment of the effects of cashless policy on financial inclusion in the Nigerian emerging economy. The findings reveal that, the cashless policy maintained a non-significant relationship with financial inclusion both in urban and rural areas of Nigeria. Also the findings show that the cashless policy had a significant effect on increasing customers' deposits in commercial banks of Nigeria. The identified gap in this study is that, the study dwell so much on branches of commercial banks and ATM centers/outlets, POS and web base technique with special reference to branches of commercial banks and ATM centers/outlets without regarding the debit cards (DC).



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. However, the result also indicates that the impact of ATM services in terms of availability of money is positive but insignificant. The identified gap in this research is that, the research talks so much on the perceived ease of use transaction cost and service security with reference to automated teller machine (ATM) without taken into considering the point of sale (POS) device in the first thought.

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

However, from the above studies conducted by different researchers, it was found that even though they discovered the need for a study related to this research work but it was also visible that none of these studies was done in the background of the impact of financial technology on financial inclusion in Nigeria. A study on Kaduna State Metropolis. Therefore, this study seeks to fill this gap by suggesting a strategy which is hoped to improve the state of financial inclusion in Nigeria. A study on Kaduna State Metropolis.

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 I Hicks 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 processes. 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

Quantitative research method was used in this research study. The hypothesis proposed was tested using PLS-SEM. The populations of the study hold 5, 55,000 financial included person's which are the populations of this study. The sample size of 384 respondents from four LGAs was chosen. The local governments are Kaduna North, Kaduna South, Igabi and Chukun in Kaduna metropolis. The reason for chosen Kaduna metropolis is due to the heavy economic activities, population density, as well as perceived high concentration of E-banking services. Thus, the sample size of this research study was determined through Krejcie and Morgan population/sample determinant table (1970). According to Krejcie and Morgan population/sample determinant table (1970) any sample size equivalent to the population size of 5, 55,000, the sample size will be 384. 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 ATM,POS and DC is accessible beyond regular business hours". Items operationalized to measure fintech 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 ATM 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 ATM, POS, DC, QTY, ACC, and USG.

Table 2 Descriptive Statistics for ATM, POS, DC, QTY, ACC, and USG.

		Minimum	Maximum	Mean	Std. Deviation
Automated Teller Machine	ATM	1	5	3.81	1.09
Point of Sale	POS	1	5	3.81	1.09
Debit Card	DC	1	5	3.71	1.11
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 2, the mean score and std. deviation of the constructs or latent variables (ATM, POS, DC, QTY, ACC, USG) range from 3.68 to 3.98 with a standard deviation ranging from 0.92 to 1.11 respectively. In specific, the independent variable, ATM, POS and DC had a minimum value of 1 and maximum value of 5 with mean value of 3.81, 3.81 and 3.11 which is the same with the scale of four (4) agree and std. deviation of 1.09, 1.09 and 1.11 which depict variance of one (1) respectively. However, this shows that, majority of the respondents are of the opinion that ATM, POS and DC services are 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 quality of service.

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, and Ray, 2016; Sarstedt, Hair, Ringle, Thiele, and 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 3 below shows the measurement model.

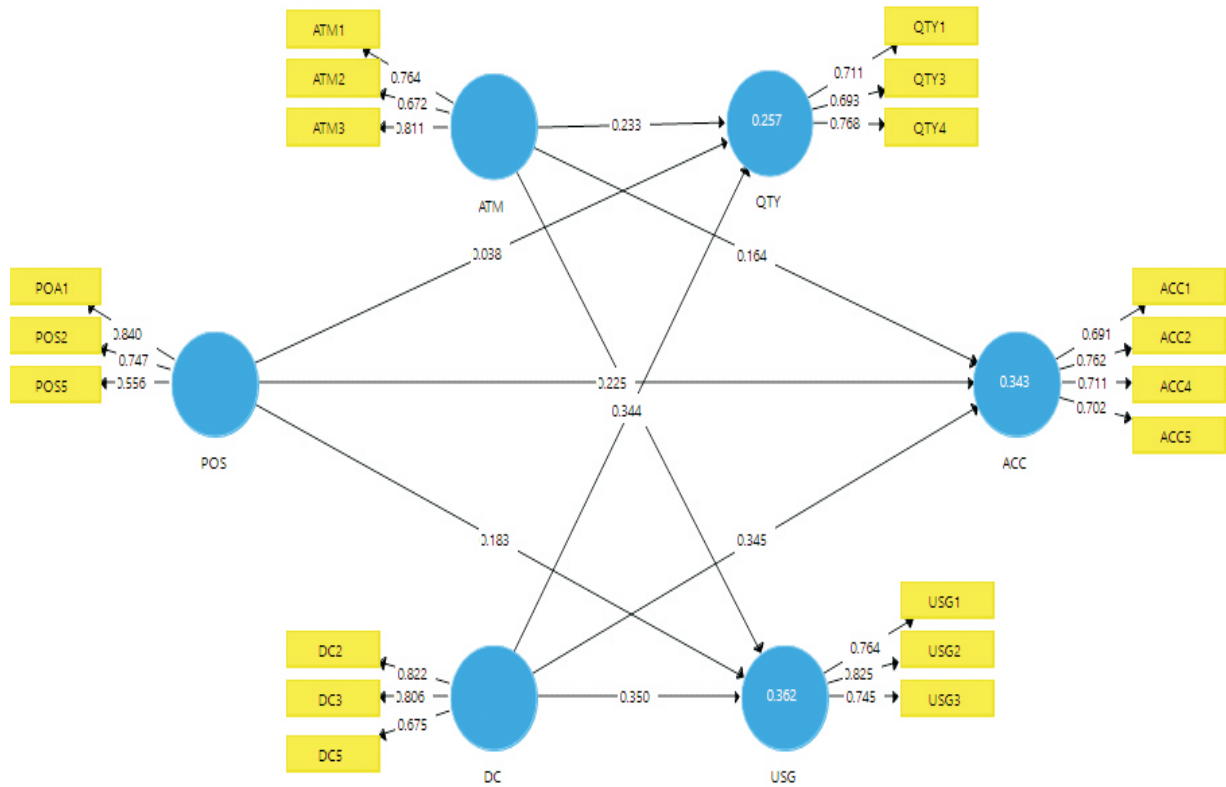


Figure 1 Measurement Model Results

Table 3 Measurement Model Results

Construct and Indecators	Loadings	Composite Reliability	Average Variance extracted (AV E)
Accessibility			
ACC1	0.691	0.809	0.515
ACC2	0.762		
ACC4	0.711		
ACC5	0.702		
Automated Teller Machine			
ATM1	0.764	0.794	0.564
ATM2	0.672		
ATM3	0.811		
Debit Card			
DC2	0.822	0.813	0.594
DC3	0.806		
DC5	0.675		

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		

Researcher's computation

From the above Table 3, individual indicator reliability was measured by studying the outer loadings of the latent variable (Hair, Ringle, and Sarstedt, 2014; Byrne, 2001; Hulland, 1999). The standard range values of 0.5 to 0.7 are the acceptable values for indicator reliability proposed by Byrne (2001) and Hair, et al., (2014). Thus, from Table 3 above the outcome of the loading of the 19 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 Baggazzi (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 3 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 and Larcker, (1981) hold that, the threshold for AVE should be at least 50% (0.5) and in Table 3 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 4 below.

Table 4 Results of Discriminant Validity Test (Fornell -Larcker Criterion)

	ACC	ATM	DC	POS	QTY	USG
ACC	0.717					
ATM	0.397	0.751				
DC	0.510	0.392	0.771			
POS	0.451	0.433	0.448	0.724		
QTY	0.399	0.384	0.453	0.293	0.725	
USG	0.585	0.442	0.521	0.438	0.386	0.779

Source: Researcher's computation

Discriminant validity as presented in Table 4 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 5 below show the conclusions of the full structural model for this research study.

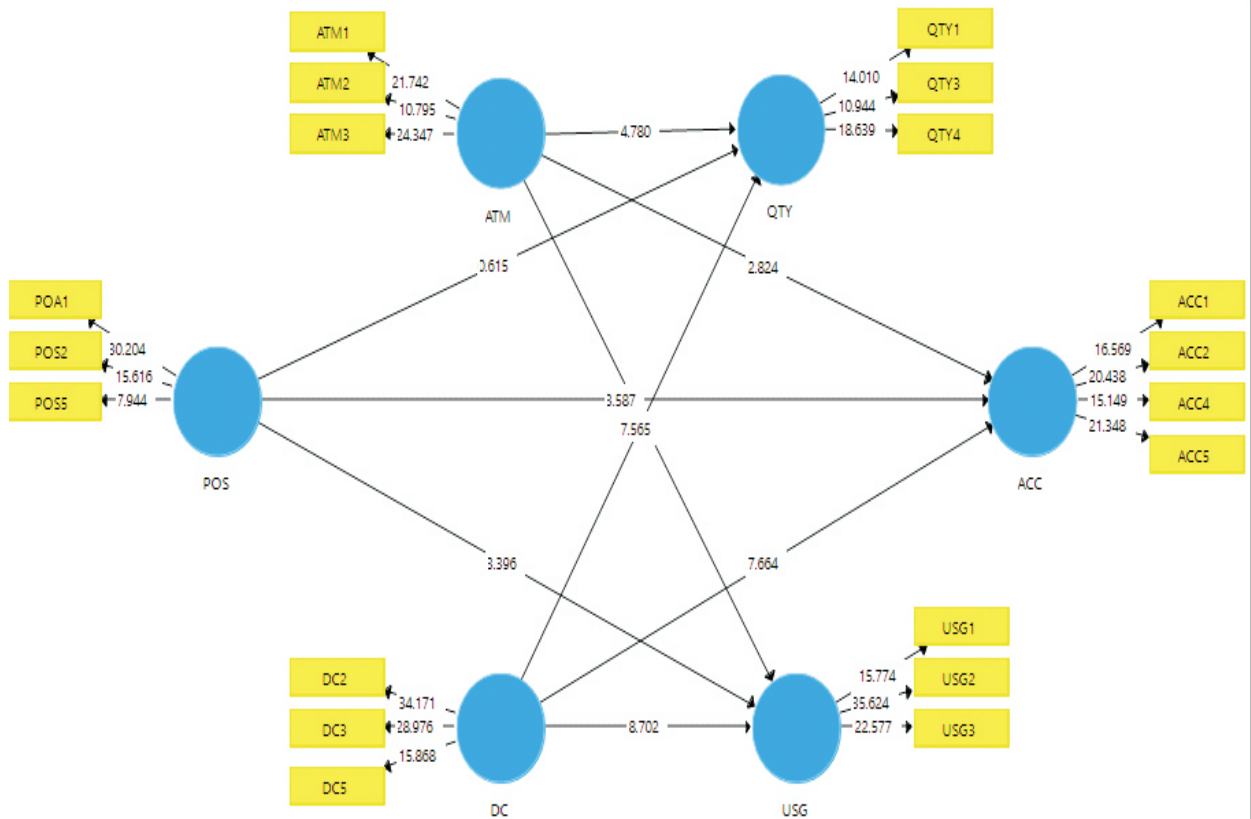


Figure 2 Structural Model

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 each latent variable to the dependent 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 5

Table 5 Results of Structural Model

Hypothesis	Relationship	Beta	SE	t-value	p-value	Findings
H1	ATM → ACC	0.164	0.058	2.824	0.005	Not Supported
H2	ATM → QTY	0.233	0.049	4.780	0.000	Not Supported
H3	ATM → USG	0.226	0.081	2.798	0.005	Not Supported
H4	DC → ACC	0.345	0.045	7.664	0.000	Not Supported
H5	DC → QTY	0.344	0.046	7.565	0.000	Not Supported
H6	DC → USG	0.350	0.040	8.702	0.000	Not Supported
H7	POS → ACC	0.225	0.063	3.587	0.000	Not Supported
H8	POS → QTY	0.038	0.061	0.615	0.539	Supported
H9	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, nine (9) hypotheses were posited out of which only eight (8) were statistically significant. However, it could be recalled at the beginning that, Hypothesis 1 predicted that, ATM has no significant impact on ACC. Though, as indicated in Figure 2 and Table 5, there exist a significant impact between ATM and ACC. That is, ($\beta = 0.164$, $t = 2.824$, $p < 0.05$). Thus, Hypothesis 1 not supported. Similarly, Hypothesis 2 predicted that, ATM has no significant impact on QTY. Still, as indicated in Figure 2 and Table 5, there exist a significant impact between ATM and QTY. That is, ($\beta = 2.233$, $t = 4.780$, $p < 0.05$). Thus, Hypothesis 2 not supported. Beside, Hypothesis 3 predicted that, ATM has no significant impact on USG. Yet, as indicated in Figure 2 and Table 5, there exist a significant impact between ATM and USG. That is, ($\beta = 0.226$, $t = 2.798$, $p < 0.05$). Hence, Hypothesis 3 not supported.

Furthermore, Hypothesis 4 predicted that, DC has no significant impact on ACC. Moreover, as indicated in Figure 2 and Table 5, there exist significant impact between DC and ACC. That is, ($\beta = 0.345$, $t = 7.664$, $p < 0.05$). Therefore, Hypothesis 4 not supported. Again, Hypothesis 5 predicted that, DC has no significant impact on QTY. Also, as indicated in Figure 2 and Table 5, there exist a significant impact between DC and QTY. That is, ($\beta = 0.344$, $t = 7.565$, $p < 0.05$). Hence, Hypothesis 5 not supported. In addition, Hypothesis 6 predicted that, DC has no significant impact on USG. Though, as indicated in Figure 2 and Table 5, there exist significant impact between DC and USG. That is, ($\beta = 0.350$, $t = 8.702$, $p < 0.05$). Thus, Hypothesis 6 not supported. Conversely, Hypothesis 7 predicted that, POS has no significant impact on ACC. Therefore, as indicated in Figure 2 and Table 5, there exist a significant impact between POS and ACC. That is, ($\beta = 0.225$, $t = 3.587$, $p < 0.05$). Consequently, Hypothesis 7 not supported. Conversely, Hypothesis 8 predicted that, POS has no significant impact on QTY. Still, as indicated in Figure 2 and Table 5, there exist no significant impact between POS and QTY. That is, ($\beta = 0.038$, $t = 0.615$, $p > 0.539$). Thus, Hypothesis 8 supported. Lastly, Hypothesis 9 predicts that, POS has no significant impact on USG. However, as indicated in Figure 2 and Table 5, there exist a significant impact between POS and USG. That is, ($\beta = 0.183$, $t = 3.396$, $p < 0.05$). Thus, Hypothesis 9 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 6 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 6 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

The main objective of this study is to find out the impact of the relationship between Fintech (ATM, POS and DC) on financial inclusion (ACC, QTY, and USG) in Kaduna metropolis. Though, the research finding reveals that ATM, POS and DC significantly impact ACC, QTY, and USAG in a specific manner, while the implications of the study are significantly material to theory and practice. The study recommends that, the financial institution in Kaduna State metropolis should create positive impact on educating and enlightening the financially included populace in Kaduna State metropolis about the digital financial products and services, how to use it, it economic benefit and also to make the financial product and services more accessible and also to improve quality of service so as to improve the usability of such product and services in Kaduna State metropolis.

REFERENCES

- Bagozzi, R. R. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 074–094.
- Chin, W. W. (1988). The partial least squares approach to structural equation modeling in In G.A Marcoulides (Ed.), *Modern methods for business research*. Mahwah, NJ: Lawrence Erlbaum.
- Beck T., Demircug- Kunt A. and Levine R. E. (2007) Finance, inequality and the poor" *Journal of Economic Growth* 12(1) 27-49.
- Bruhn, M., & Love, I. (2014). The real impact of improved access to finance: Evidence from Mexico. *The Journal of Finance*, 69(3), 1347e1376.
- Byrne, B. M. (2001). Structural equation modeling with AMOS: *Basic concepts, applications, and programing*. *Structural Equation Modeling*. <https://doi.org/10.4324/9781410600219>.



- Chin, W. W. (1988). *The partial least squares approach to structural equation modeling in In G. A. Marcoulides (Ed.), Modern methods for business research*. Mahwah, NJ: Lawrence Erlbaum.
- Chishti, S., & Barberis, J. (2016). *The Fintech Book: The Financial Technology Handbook for Investors, Entrepreneurs and Visionaries*. John Wiley & Sons.
- Economic Times News*(2018)
- EFInA (2020) Access to Financial Services in Nigeria 2020 survey*.
- (EFInA (2014) *Access to financial services in Nigeria survey* 2014).
- Emefiele (2017) *News Report*
- Falk and Miller (1992) *A primer for soft modeling*. University of Akron Press.
- Fornell, C., & Larcker, D. (1981). Structural equation models with unobservable variables and measurement error: algebra and statistics. *Journal of Marketing Research*, 18(3), 382–388.
- Rogers, E.M (2003). *Diffusion of innovations* (5th ed.). New York, US: Free Press
- Rogers, E.M. (1983) *Diffusion of Innovations*, New York: Free Press.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modelling (PLS-SEM)*.
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Hannig, A., & Jansen, S. (2010). Financial inclusion and financial stability: *Current policy issues*.
- Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modelling in new technology research : Updated guidelines using PLS path modelling in new technology research : updated guidelines. *Industrial Management & Data Systems*, (October 2015).
- Hicks, D. & Niehans, J. (1983). Financial innovation, multinational banking and monetary policy. *Journal of Banking and Finance*, 537-551.
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(April 1998), 195–204.
- Israel, G.D. (2013). Determining sample size. *Journal of Business Research*, 1(1), 1-5
- Kama, U. and Adigun, M., 2013. *Financial Inclusion in Nigeria: Issues and Challenges*, CBN Occasional Paper 45.
- Michael (2018). *International Journal of Research and Innovation in Social Science (IJRISS)* Volume Issue X, October 2018|ISSN 2454-6186 www.rsisinternational.com.
- Mobey Forum (2011) *Digital Money Forum*.
- Sanusi (2012) *CBN News Report*
- Sanusi (2010) *CBN News Report*
- Sarstedt, M., Hair, J. F., Ringle, C. M., Thiele, K. O., & Gudergan, S. P. (2016). Estimation issues with PLS and CBSEM? Where the bias lies?! *Journal of Business Research*, 69(10), 3998–4010. <https://doi.org/10.1016/j.jbusres.2016.06.007>.
- Serrano-Cinca, C., Rueda-Tomás, M., & Portillo-Tarragona, P. (2012). *Factors influencing e-disclosure in local public administrations*. *Environment and Planning C: Government and Policy*, 27(2), 355–378.
- Stephen & Sibert (2014). *Mediterranean Journal of Social Sciences* MCSER Publishing, Rome-Italy



- Sunday (2018), *Empirical assessment of the effects of cashless policy on financial inclusion in the Nigerian emerging economy*
- Tabitha & sella (2019). *Journal of Emerging Technologies and Innovative Research (JETIR)* www.jetir.org
- United Nations. (2016). Digital financial inclusion. international telecommunication union (itu), issue brief series, inter-agency task force on financing for development, July. United Nations. Available at: http://www.un.org/esa/ffd/wp-content/uploads/2016/01/Digital-Financial-Inclusion_ITU_IATFIssue-Brief.pdf. (Accessed 10 November 2017).
- World Bank Report, 2012. *World Bank*.