Economic Analysis of the Determinants of Consumers' Behaviour and E-Commerce Adoption in Adamawa State: A Case Study of Modibbo Adama University, Yola

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Abstract

This study examined the determinants of consumers' behaviour towards e-commerce. The study was pinned on the Transaction Cost Theory and Technology Acceptance Model. About 449 students and staff members of Modibbo Adama University, Yola Nigeria filled the questionnaire. The study employed Multiple Regression Analysis to determine the relationship among Perceived Usefulness, Perceived Ease of Use, Perceived Security, Privacy Concerns, Age, and E-commerce Adoption. The results showed that Perceived Ease of Use and Perceived Usefulness have positive and statistically significant relationship with E-commerce Adoption ($p < 0.05$). Perceived Security and Privacy Concerns have positive but statistically insignificant relationship with E-commerce Adoption. Age has a negative and statistically significant relationship with E-commerce Adoption. The study therefore recommended that policy makers should implement policies, guidelines, and mechanisms to curb the rate of privacy infringement and fraudulent activities in the digital space, thereby increasing the security of digital channels. Business organizations should enhance their websites and channels of transactions in order to increase the perceived ease of use and perceived usefulness. The results contribute to the development of economics by applying Transaction Cost Theory and Technology acceptance model to analyze factors that drive ecommerce adoption in Nigeria.

Keywords: Consumers' Behaviour; Transaction Cost, Ecommerce, Technology, Development

Introduction

The world is changing into a global digital community with increase in the adoption of digital technologies. Nigeria is also evolving into a digital community, and this exposes businesses to great growth opportunities. From the study's perspective, electronic commerce (E-commerce) has become a prominent subject of discussion. This is because it is the process by which buyers and sellers utilize electronic channels of communication and transaction, thereby leapfrogging boundaries, defying distance, and reducing transaction costs. The internet provides consumers with a means of easier access to information and sellers than other sales channels.

Financial technology (Fintech) taps into the current disruption by providing solutions that can satisfy the needs of consumers in a better way by providing convenience, enhanced accessibility, and tailored products via technology applications on the customers' devices. This helps consumers to access information, initiate and complete transactions in a convenient manner, and connect to third party entities without barriers of time and location (PWC, 2017).

In order to survive in the business environment, business firms and organizations must key in to the wave of digital disruption. The rate of mobile penetration in Nigeria is very high. Seventy-five percent (75%) of the population use a mobile phone (Central Bank of Nigeria, 2018). Consumer behaviour is also moving towards digital financial services as the value of electronic transaction increased right from 2012. This growth has been facilitated by introduction of the cashless policy

in some states and the resulting increase in digital banking investments by financial services providers (Central Bank of Nigeria, 2018).

Digital technology is facilitating growth in the non-oil sectors of the Nigerian economy which include media, finance, entertainment and fast-moving goods sectors. Digital technology enables businesses to 'leapfrog' bad roads and connects consumers to markets. Access to internet creates jobs, provides financial services to unbanked populations and enables government to provide education and health services online (The Economist, 2016).

Ecommerce, via digital technology has the capacity to bring about development and increase in the standard of living, hence, enhancing inclusive and sustainable development. However, the digital business environment has its unique challenges. These include invasion of privacy, insecurity of transactions, harassment, and so on. Hence, this paper will present a modified version of the technology acceptance model by including variables such as perceived security and privacy concerns.

Theoretical Framework

Transaction Cost Theory

Transaction cost theory explains why a consumer goes for a particular form of transaction over others. The basis of transaction cost theory is that people prefer to conduct transactions in the most economical way. Online transactions can be considered as an alternative to buying from traditional stores, therefore, it is rational for consumers to opt for the channel that offers the lowest transaction cost (Mukherjee, Benerjee & Bandyopadhyay, 2012). Transaction cost refers to any cost involved in engaging in an economic transaction. This includes cost incurred in during the sale or purchase of a product or service. Transaction costs are the result of incomplete and lopsided information among economic agents involved in an economic transaction. There are three types of transaction costs. This includes: search costs, negotiation (bargaining and decision) costs and monitoring (policing and enforcement) costs.

Search costs refer to the costs involved in discovering possibilities for mutual gains, identifying sources of funds, relevant stakeholders and the costs of getting information. Negotiation (bargaining and decision) costs refer costs of negotiating the terms of the contract or transaction. Monitoring (policing and enforcement) costs refer to the costs of monitoring and enforcing the transaction/contract, by making sure the other party complies with the terms of the contract.

Technology Acceptance Model (TAM)

Technology Acceptance Model originally expounded consumer behavior in adopting new technology and itemized vital factors which affect users' acceptance. The expanded version of the model takes in consideration, social influence factors, such as subjective norms, voluntariness and image (Venkatesh & Davis, 2000).

Davis (1989) used the technology acceptance model to explain the relationship between perception, emotions and innovative technology. Different from theory of planned behavior (TPB), TAM posits that individuals are, sometimes, induced to accept new technology because of work, so they have no control over the use of new technology. The central theme of TAM is that perceived usefulness and perceived ease of use will have influence on the acceptance of technology by an individual, and these two constructs are often used to test users' experience of using high tech products/services. Perceived usefulness defines "the degree to which a person believes that

using a particular system would enhance his or her job performance" (Davis, 1989). It relates to productivity, performance and effectiveness (Davis, 1989) and it springs from the benefits of increasing work efficiency and learning performance. Perceived ease of use connotes "the degree to which using the technology will be free of effort (Davis, 1989). Venkatesh (2000) states that perceived ease of use is a crucial factor that influences users' acceptance and behavioral intention.

Empirical Review

Ishfaq and Mengxing (2022) analysed the consumer usage behaviour of internet-based services (IBS) in Pakistan during COVID -19 crises. The study was hinged on the technology acceptance model. Linear Regression was employed, and the results revealed that Perceived Usefulness (PU) had a significant positive effect on Attitude towards IBS, while Perceived Ease of Use did not have significant effect on Attitude towards IBS.

Moslehpour, Pham, Wong, and Bilgicli (2018) examined the influences of conscientiousness, openness, perceived usefulness and perceived ease of use on e-purchase intention. Structural equation modelling technique was employed, and the results indicate that perceived ease of use and openness had significant positive impacts on e-purchase intention.

Roudposhti, Nilashi, Mardani, Streimikiene, Samad, and Ibrahim (2018) analysed the factors that influence the purchase intention of consumers. Partial Least Square equation modelling was used, and the results revealed that accuracy, diversity, trust and usefulness have significant influence purchase intention of consumers.

Ionas and Stoica (2014) studied the impact of social media on consumer behavior, using univariate and bivariate analysis. The results revealed that the reasons while most consumers prefer online transactions include: convenience and delivery of products to their homes.

Dost, Illyas and Rehman (2015) examined the buying behavior of consumers and revealed that changes in online buying determined by: trust, convenience, product variety and privacy. The study was carried out in Pakistan. Pearson correlation analysis and Regression analysis were used. The results indicated that convenience and trust greatly and positively affected consumers' decision to buy products online. The findings on the effect of convenience are in agreement with the result of the study by Wang, Ye, Zhang and Nguyen (2005) which indicated that convenience is one of the most impactful factors that affect consumers' willingness to adopt online shopping.

Hasan, Harun, and Rashid (2015) investigated the factors that influence online brand purchase intention. Multiple regression analysis was employed. The results reveal that perceived ease of use, and the website brand name had a positive and significant relationship with purchase intention.

Bankole, Bankole and Brown (2011) investigated the factors that affect the acceptance of mobile banking in Nigeria. Regression analysis was employed, and the study was pinned on the Technology Acceptance Model. The results revealed that perceived ease of use (effort expectancy) positively affected behavioural intention to use mobile banking services. Effort expectancy had a positive correlation with behavioural intention at 0.141, $p<0.05$ at 18% of the variance in the data.

Osho, Onuoha, Ugwu and Falaye (2016) carried out a survey of security awareness of customers and factors that influence acceptance. The results of the study revealed that more than half of the customers (61.4%) on e-commerce sites made use of online platforms because they found it convenient or easy. The next motivating reason for purchasing on e-commerce site was the offer of delivery of purchased items the desired location of the customer at no extra cost. The study also revealed that most consumers prefer payment online. When asked if they were satisfied with the

service provided by e-commerce sites, most consumers (51%) reported in the affirmative. From the empirical review, it can be clearly seen that none of these studies focused on the North East region of Nigeria, particularly, Yola, Adamawa State. Hence, this study intends to fill this gap.

Methodology

Participants and procedure

Primary data on consumers' attitude towards e-commerce were collected. Simple random sampling technique was used to select the sample from a population of 16543 which consisted of staff and students of Modibbo Adama University, Yola. According to Singh (2003), simple random sampling is a method of selection, which is based on the selection of each sample, unit by unit, with equal probability of each unit being selected at each draw.

To calculate the sample size, the study employed Taro Yamane (Yamane, 1973) formula with 95% confidence level. The Taro Yamane's formula is given as:

$n = N/(1+N(e)^2)$

Where, n= sample size required, N = number of people in the population, e = allowable error (%)=0.05

Hence, for a population of 16543, the sample size was 391. However, in order to minimize errors, 449 questionnaires were administered to the respondents and a five-point Likert scale was used for measurement.

Variables and measurement

The study adopted measurement scales from previous research, which was based on the Technology Adoption Model (Perceived usefulness, perceived ease of use). Perceived security and Privacy Concern were also used. The measurement scales for perceived behavioural control were created by the study.

In order to verify the validity of the research instrument, content validity and face validity were carried out. For estimating content validity, the questionnaire was examined by experts in Economics. The purpose of this was to check the suitability and applicability of questions related to each variable.

A pilot study was carried out in order to confirm face validity. The questionnaire was administered on the sample and the opinions of the respondents about the research and quality of items were noted.

In order to establish the reliability of the questionnaire, its internal consistency was tested through Cronbach Alpha. Cronbach's alpha is a statistic widely employed by authors to prove that tests and scales that have been constructed or adopted for researches are appropriate for the purpose (Taber, 2018). This test confirms whether all the questions exhibit appropriate internal consistency, that is, if they all measure a common construct. A reliable scale is often indicating a Cronbach alpha value of 0.60 and above. The results of the test revealed that purchase intention had an E-commerce Adoption with a Cronbach Alpha value of 0.77, Perceived Ease of Use (PEU) had a Cronbach alpha value of 0.69, Perceived Usefulness (PU) had a Cronbach alpha value of 0.85, Perceived Enjoyment had a Cronbach alpha value of 0.743, and Perceived Security had a Cronbach Alpha value of 0.67. These results indicated that the key variables are reliable for the analysis as they all have Cronbach alpha values that are above 0.60.

Pre-estimation Diagnostics

The author tested for multicollinearity, and heteroscedasticity.

Table 1: Results of Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.047867	58.51564	NA
PU	0.001945	43.40345	1.712226
PEOU	0.002230	52.11827	1.644216
PSEC	0.001339	24.34576	1.093703
PRIV	0.000695	14.54737	1.061190
AGE	8.36E-06	9.857125	1.014785

Source: Author's computation using E-views (2023)

The results of the multicollinearity test indicate that the Variance Inflation Factor (VIF) of each variable is less than 10. Therefore, there is no serial multicollinearity in the model as shown in Table 1.

To test for heteroscedasticity, the Breusch Pagan Godfrey Test was employed. The result indicates a p value of 0.07 ($p>0.05$), which means we decline to reject the null hypothesis of no heteroscedasticity. Therefore, there is no heteroscedasticity in the model as revealed in Table 2.

Table 2: Results of Heteroskedasticity Test (Breusch Pagan Godfrey Test)

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.030712	Prob. F(5,443)	0.0732
Obs*R-squared	10.06050	Prob. Chi-Square(5)	0.0735
Scaled explained SS	15.54328	Prob. Chi-Square(5)	0.0083

Source: Author's Computation Using Eviews (2023).

Result of the Findings

Multiple regression model was used in this study. It is consisting of a linear function of two or more independent variables which explain the variation of a dependent variable. This model was hinged on the Theory of Planned Behaviour. A number of studies employed this model to analyze Ecommerce Adoption. These were studies by Bankole *et al* (2011), and Dost *et al* (2015).

The multiple regression model used in this study is specified below:

$Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$

It is re-specified as:

$EADP=\beta_0 + \beta_1 PU + \beta_2 PEOU + \beta_3 PSEC + \beta_4 PRIV + \beta_5 AGE + \varepsilon$

Where,

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Parameters that were estimated

EADP = Ecommerce Adoption, PU = Perceived Usefulness, PEOU= Perceived Ease of Use

PRIV = Privacy Concerns, AGE = Age of respondent, ε = Error term

Regression Results

Table 3: Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.976231	0.218784	9.032785	0.0000
PU	0.226775	0.044105	5.141667	0.0000
PEOU	0.280746	0.047223	5.945124	0.0000
PSEC	0.045592	0.036598	1.245741	0.2135
PRIV	0.031477	0.026361	1.194072	0.2331
AGE	-0.007081	0.002891	-2.449029	0.0147
R-squared	0.302364	Mean dependent var		4.222717
Adjusted R-squared	0.294490	S.D. dependent var		0.721525
S.E. of regression	0.606043	Akaike info criterion		1.849541
Sum squared resid	162.7085	Schwarz criterion		1.904423
Log likelihood	-409.2219	Hannan-Quinn criter.		1.871174
F-statistic	38.40026	Durbin-Watson stat		1.779865
Prob(F-statistic)	0.000000			

Source: Authors Computation Using Eviews (2023).

The F statistic derived from the Regression Analysis presented in Table 3 shows that all the independent variables measured are jointly significant ($p<0.05$). Perceived Usefulness (PU) has a positive and statistically significant relationship with Ecommerce Adoption (EADP), that is, the p value is 0.0000 ($p<0.05$). This implies that Perceived Usefulness of E-commerce technology by a consumer increase, the adoption of E-commerce increases. This result is in consonance with the result of the studies by Ishfaq and Mengxing (2022), and Roudposhti *et al* (2018).

Perceived Ease of Use (PEOU) has a positive and statistically significant relationship with Ecommerce Adoption (EADP), with a p value of 0.0000 ($p<0.05$). This result is in harmony with the results of the study carried out in Pakistan by Dost *et al* (2015) which revealed that change in online buying is determined by: trust, convenience, product variety and privacy. The result is also in agreement with results of the study carried out in Nigeria by Bankole *et al* (2011). Other studies that are in consonance with the results include Ionas and Stoica (2014), Hasan *et al* (2015); Osho *et al* (2016), Molsehpour *et al* (2018) and Wang et al (2005).

Perceived Security has a positive but not statistically significant relationship with E-commerce Adoption, with a p value of 0.2135 ($p > 0.05$) The positive relationship is in agreement with Roudposhti (2018), and Dost et al (2015).

Privacy Concerns has a positive but not significant relationship with Ecommerce Adoption, with a p value of 0.2331 ($p<0.05$). This positive relationship is in consonance with Dost *et al* (2015).

Age of the respondents has a negative and statistically significant relationship with purchase intention, with a p value of 0.0532 ($p<0.05$). This result agrees with that of Frasquet, Ruiz-Molina and Molla-Descals (2015). Ahkter (2003) also revealed that as people become older, they tend to be more cautious, and seek higher certainty in their purchase decisions.

Conclusion

This study has examined the economic determinants of consumers' behaviour and e-commerce adoption in Adamawa State using the case of Modibbo Adama University, Yola, Nigeria. The result of this study indicated that Perceived Ease of Use and Perceived Usefulness have positive

and statistically significant relationship with Ecommerce Adoption ($p < 0.05$). Perceived Security and Privacy Concerns have positive but not statistically significant relationship with Ecommerce Adoption ($p > 0.05$). Age has a negative and statistically significant relationship with Ecommerce Adoption ($p<0.05$).

Recommendations

Based on the findings of the study, the following recommendations were made;

i. Policy makers and regulatory agencies should design and implement policies, guidelines, and mechanisms to reduce the rate of privacy infringement and fraudulent activities in the digital space, thereby increasing the security of digital channels.
ii. Business organizations should improve their websites and transaction channels in order to increase the perceived ease of use and perceived usefulness.

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