International Journal of Intellectual Discourse (IJID)
ISSN: 2636-4832 Volume 4, Issue 3. September, 2021

The impact of COVID-19 on customers' online banking and e-payment usage in Nigeria

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Abstract
This study investigated the nexus between relationship integration, product availability and customer satisfaction of downstream petroleum sector in Nigeria. The study population was 930, deduced from seven petroleum major oil marketing companies, with a sample size of 280 top management staff responded to the questionnaire and partial least square-structural equation modeling was used for data analysis. This study revealed that relationship integration positively and significantly relates to product availability and customer satisfaction of downstream petroleum sectors. It concluded that relationship integration is a salient factor to enhance marketing performance. This study recommended that management of petroleum major oil marketers should ensure greater interaction, cooperation and collaboration with agencies and supplier units to ensure product availability, customer satisfaction and to reduce supplier lead time.

Keywords: e-payment, perceived usefulness, perceived ease of use, attitude, customers

1. Introduction

The intention to either adopt or use technology in solving individual problems such as online banking or e-payment are developed topics in the literature. Though there are previous works on the subject matter, the technology acceptance model (TAM) stands exceptional in that regards because it tries to show how some variables influence customer's decision on how and when to use a technology (Fishbein, &Ajzen, 1975). Presently, however, COVID-19 drastically affect many economies around the world. Financial institutions have been shut-down in most of the affected countries. In a bid to reduce the spread of the virus, African authorities introduced measures to encourage social distancing, and ban all sort of large gatherings which force banks and other financial outlets to close down completely. Consequently, COVID-19 pandemics has changed the way and manner people shop, work, socialize, banking and make payments. As the pandemic continues, the new trend of work-from-home emerged due to the closing-down of most banking halls and branches altogether, many customers were left with no options other than to change their pattern of banking and payment. As a necessity, some customers were forced to embraced digital options as a means of payments, while others moved to digital options for the first time. Hence the influence of COVID-19pandemics on customer's decision to use online banking and e-payment services is yet to be explored by researchers.

Therefore, the present study used the technology acceptance model to explore how COVID-19 pandemics changes the customers' mindset in using online

banking and e-payment services. Review of literature reveals that the acceptance of technology has scarcely been explored (Franklin, & Molebash, 2007; Hew, & Brush, 2007), while others argued that the model is more effective in some cases compared to others (Hsieh, Yang, Yang, and Yang, 2013; Lok, 2015). Hence, the present study intends to bridge the knowledge gap by using five variables adapted from the technology acceptance model to measure howCOVID-19pandemics forced the customers to use online banking and e-payment services. The dependent variable in the study is online banking and e-payment usage by the customers (OBEU) while the intention to use online banking (IUOBE) and attitude towards the use of online banking and e-payment (ATUBE) served as the mediating variables in the model. Correspondingly, perceived use of online banking and e-payment services (PUOBE) and perceived ease of use of online banking and e-payment services (PEU) are regarded as background factors in the model.

2. Literature Review and Hypotheses

This section provides an overview of related literature using variables from the Technology Acceptance Model (TAM). In line with the reviewed literature, the research hypotheses were formulated. We then examine the potential role of e-payment usage as the key backgrounds to the Technology Acceptance Model (TAM).

2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by (Davis, 1989; Davis, Bogozzi, & Warshaw, 1989) originated from the theory of reasoned action (TRA)(Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). According to TAM, an individual's belief is determined by his/her attitude towards thinking which eventually influence positively on behavioral intention and result to actual behavior. TAM further proposes that two distinct beliefs namely perceived usefulness and perceived ease of use are important factors in determining users' intention. Perceived usefulness is defined as the degree to which an individual believes that using a particular system will improve his or her job performance, while perceived ease of use is defined as the rate at which an individual believes that using a particular technology will be free and effortless. Theoretically, perceived ease of use is assumed to be a good predictor of perceived usefulness. Thus, the present study adopts TAM model to examine the extent to which the COVID-19 pandemics force customers to switch to using online banking and e-payment services.

2.2 Relationship between Intention to Use and Online banking and e-payment usage: Theoretically, intention to use a technology is a key determinant of the actual use of the technology (Davis, 1989; Davis et al., 1989). Consistent and significant positive effect of intention to use online banking and e-payment services and actual usage has been extensively explored and evidenced in the online banking literature has been established. For instance, intention to use online services has been found to be a significant to actual usage (Goyal, Maity, Thakur, & Srivastava,2013; Hong, Thong, & Tam, 2006; Kang, Hahn, Fortin, Hyun, & Eom, 2006; Kang, Lee, Park, Chung, & Blakeney, 2012). Thus, the present study proposed that if an individual customer believe that he will contact COVID-19 virus whenever he/she goes to banking hall or ATM machine, he will have a positive attitude towards using online banking and e-payment services. In turn, the customer will have the intention to use the technology which will lead to the use of

online banking and e-payment services as an alternative. Therefore:

H1: *Intention to Use has a significant positive impact on online banking and e-payment usage*

2.3 Relationship between attitude towards and intention to use online banking and e-payment: Review of literature reveals that TRA served as the bases of TAM (Fishbein & Ajzen, 1975), which postulates that behavior of individuals is determine by their intention which ultimately shaped their respective attitudes toward the behavior. Therefore, to convince customers to either accept or use a technology, Rogers (1995) suggested that it comprises of two stages; firstly, the customer ought to obtain the technical know-how about the technology and secondly, form an attitude toward the use of the technology. Thus, attitude towards the use of a technology is subject to the immediate effects of both PU and PEOU. There is a consensus, in the body of literature that attitude towards the use technology exerts significant positive effect when its combine with intention to use (Alharbi, & Drew, 2014; Kuo, & Yen, 2009; Karahanna et al., 1999; Pavlou, 2003). Thus, the present study suggested that attitudes towards the use of online banking and e-payment services depend on the individuals' beliefs that if the online banking and e-payment services are the only alternative because all banking outlets are closed due to COVID-19pandemics, the customer will perceive usefulness and ease of use of the online banking and e-payment services. Hence, he/she will have the intention to use online banking and e-payment services. Thus, hypothesis two is postulated:

H2: *Attitude towards online banking has a significant and positive impact on intention to use online banking and e-payment*

2.4 Relationship between Perceived Usefulness (PUOBE)and attitude towards Online Banking and E-payment: Perceived usefulness (PU) is one of the important key predictors in the original TAM (Davis, 1989; Hong, 2002). Davis (1989) defined perceived usefulness as the rate at which costumers believe that using a particular technology will enhance their transaction process. Additionally, Chin, Marcolin, and Newsted (1996) posit that PU must be an important element of the decision-making process when costumer usage is extrinsic. The decision to use a software or technology by the customer depends on its level of PU because it notifies the user about the gain or cost of his or her usage behavior (Lok 2015). The significant effect of PU has been extensively researched in the literature. The significance positive relationship between PU and attitude towards usage has been established (Gajanayake, 2013; Purnawirawan, 2012; Jahangir, 2008). Thus, it is assumed that the COVID-19 pandemics may likely instill positive attitude towards the use of online banking and e-payment. In turn, the customers may perceive the usefulness, compatibility and relative advantage of using the online banking and e-payment technology. Therefore, the present study proposes the below hypothesis:

H3: *Perceived Usefulness has a significant and positive impact on Attitude towards the use of Online Banking and E-payment*

2.5Relationship between Perceived Ease (PEU) and Attitude towards Online Banking and E-payments: Review of literature has shown that Online Banking and e-payments has been perceived as an innovation relatively easy to understand and use by the customers (Kevin 2020; Lai 2018; Oney, Guven, & Rizvi, 2017). Accordingly, PEOU refers to how

comfortable a customer feels about using a software or technology (Lok, 2015). Generally, the online banking and e-payments interface is simply designed, operate and user-friendly leading to easy-to-use technology, which will assist in adoption by the customers (Premkumar et al., 1995; Straub, 1989). Significantly, the influence of PEOU on Attitude toward Usage has been established in the literature (e.g., Cho, Gay, Davidson, & Ingraffea, 2003; Lu, Yu, Liu, & Yao, 2003; Shih, 2004). However, the result of the relationship is mixed. In many circumstances, its effect is found to be not significant as reported in some studies (e.g., Agarwal, 2000; Chau, 2002; Chau & Hu, 2001, 2002; Gefen, 2003; Gentry, 2002; Riemenschneider, Harrison, & Mykytyn, 2003; Schaik, 1999; Teo et al., 2003; Yi & Hwang, 2003). From the forgoing discussion, it may likely be possible to assume that as a result of the COVID-19 pandemics the customer's attitude with respect to online banking and e-payment services will change. Hence, they are more likely to perceive that online banking and e-payment technology is easy to use. This study therefore, postulated that:

H4: *Perceived Ease of Use has a significant positive impact on Attitude towards the use of Online Banking and E-payment*

3. Research Method and Design

3.1 Measures of the constructs

Items for the intention to use online banking and e-payment usage were adapted from previously validated inventory designed by Giovanis et al. (2012) and Goyal et al. (2013) and modified to fit the specific online banking and e-payment study. Similarly, the items which measure actual usage and demographic scale of the respondent were taken from the work of Lok, (2015). The items for the perceived ease of use and perceived usefulness construct were adapted from the original instrument developed by Rakhi and Mala (2013) and Postolos (2012).

3.2 Data collection procedure

The Data used in this study were collected through a self-administered questionnaire from a sample of respondents within Kaduna metropolis in Nigeria. Due to the nature and danger attributed to COVID-19pandemics, convenience sampling method was used because it allows the researcher to obtain data from respondents that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate in the study (Etikan, Musa, & Alkassim, 2016). Using the window period of Tuesdays and Wednesdays (lockdown free), a total of 400questionnaires were shared. However, 291 (73%) respondents return their questionnaires. Reason for non-participation was mainly due to frequent lockdown in the state (April, 2020).

3.3 Demography of the respondents

As mentioned earlier, 291 returned questionnaires were valid and there was no case of missing or incomplete answer. Among the 291 respondents who returned their questionnaires, 195(67%) were males, and 96 (33%) were females. The result further shows four major age groups who took part in the survey as 20-29 with a frequency of 59(19.9%); 30-39,115 (39.5%); 40-49, 100(34.4%) and 50 above,18 (6.2%) respectively. A relatively large number in terms of academic qualification was found among the respondents, ranging. Slightly more than 43.3% of the respondents are obtained Bachelor's degree/HND while (26.1%) respondents have attained masters degrees

level. the smallest group of respondents were PhD holders (0.3%) while first school certificates and Ordinary national diploma older account for (21%) of the respondents. Respondents from 5 different banks took part in the survey and thus were able to objectively express their opinions.

4. Data Analysis and Results

4.1Assessment of Measurement Model

The measurement model shows the relationship between the latent variables and the measures of each original construct.

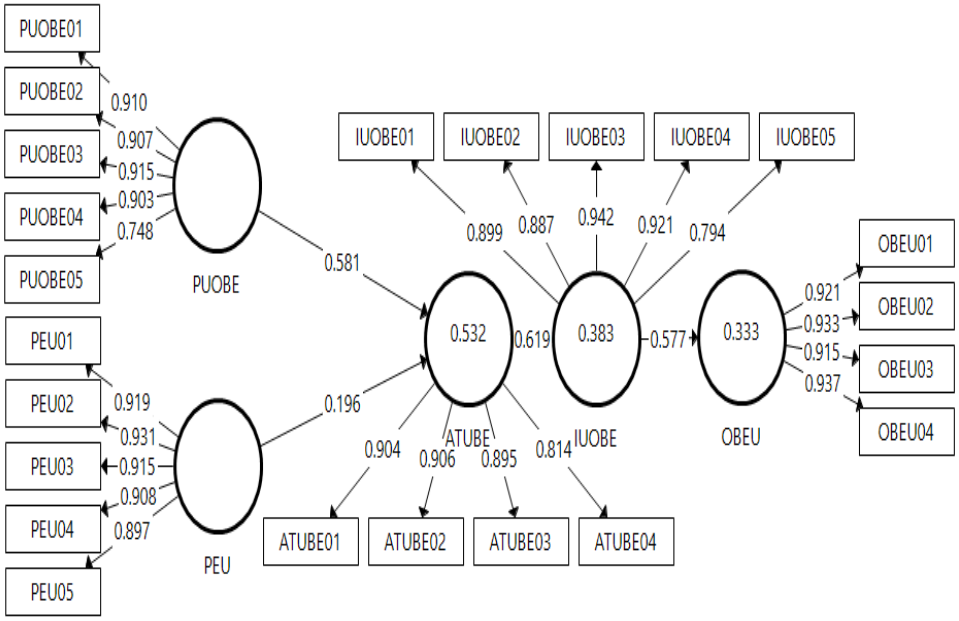

Figure 4.1Measurement Model
Sources: PLS-SEM Algorithm Output

The measurement model examined the individual item reliability, internal consistency reliability, convergent validity and discriminant validity of the model ((Hair, Ringle, & Sarstedt, 2011; Henseler, Ringle, &Sinkovics, 2009; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Figure 1 presents the measurement model of the customers. It shows the relationship between online banking and e-payment usage of the customers and other constructs.

4.2 Individual Item Reliability

The individual item reliability of the instruments was used to determine the stability and consistency of the instruments (Creswell, 2005). Individual item reliability was measured by assessing the outer loadings of a construct (Hulland, 1999; Duarte & Raposo, 2010; Hair et al., 2016). Following the rule of thumb regarding the retaining of items with loadings between 0.40 and 0.70, it was observed that all the 22 items reached the level of acceptable reliability. Therefore, the items were retained because they are within the recommended loadings (Chin 1998; Hair et al., 2016).

4.3 Internal Consistency and Reliability

The internal consistency and reliability are the assessment of the reliability and validity of the reflective outer model. The Cronbach alpha and Composite reliability coefficient are the most common estimators of internal consistency and reliability (e.g., Bacon, Sauer & Young,

1995; Peterson & Kim, 2013). In this study, therefore, the composite reliability and Cronbach alpha coefficient was used to measure internal consistency and reliability of the latent constructs (Barclay, Higgins & Thompson, 1995; Gotz, Liehr-Gobbers & Krafft, 2010). The composite reliability ensures that all formative indicators (the linkage between one variable to another) in the model had different loadings and interpreted in the same way as the Cronbach alpha. It is important to note that the interpretation of internal consistency and reliability using composite reliability coefficient depends on the rule of thumb proposed by Bagozzi & Yi (1988) and Hair et al. (2011). They suggested that the composite reliability coefficient should be at least (range ≥0.70) for a model and any value (range ≤0.60) indicates poor internal consistency and reliability suggesting that the model is not fit. Thus, composite reliability is calculated:

$$\text{Composite Reliabilit y} = \frac{\left(\sum \text{Factor Loadings}\right)^2}{\left(\sum \text{Factor Loadings}\right)^2 + \sum \text{Factor Variance}}$$

Similarly, Cronbach's was applied to ascertain how well the items grouped are positively correlated to one another. Cronbach alpha can be calculated using the formula;

$$\alpha = \frac{k}{k-1}\left(1 - \frac{k}{k + \left(\sum_i \lambda_i\right)^2 - \sum_i \lambda_i^2}\right)$$

Where α= Cronbach alpha, K= the number of items measuring the construct, λ_i= the loadings of the ith measure on the constructs. A Cronbach's alpha (α)value of (range ≥0.70) is considered to be reliable signifying that items are similar and measuring the same construct (Nunnally and Bernstein, 1994). However, Hair et al. (2006) proposed that a Cronbach alpha (α) value of (range ≤0.60) is assumed to fall within the lower value and hence is not acceptable. The consistency and reliability of the constructs was measured using convergent validity i.e. through average variance extracted (AVE)(range>0.5) (Hair et al., 1998). To assess the convergent validity of the reflective constructs, we try to compared inter-construct correlations with the average variance extracted (AVE), and the percentage of overall variance in the indicators measured by the latent construct as recommended by Fornell & Larcker (1981). Hair, Anderson, Tatham, and Black (2007) suggests values of 0.50 and above are acceptable for the AVE. If the AVE value is less than 0.50 indicates that the AVE is not valid and hence not fit for further analysis. The AVE value is calculated as the mean of the squared loadings for all indicators associated with a construct as follows:

$$\text{AVE}_{\varepsilon j} = \frac{\sum_{k=1}^{kj} \lambda_{jk}^2}{\sum_{k=1}^{kj} \lambda_{jk}^2 + \theta_{jk}}$$

Where:

$\text{AVE}_{\varepsilon j=}$ Average Variance Extracted

$\lambda_{jk=}^2$ Sum of standardized loadings square

$\theta_{jk=}$ Error variance of the k^{th} indicator (k = 1,…,K_j)

Table 4.1 presents the Cronbach's Alpha, composite reliability coefficients and the Average Variance Extracted (AVE) of the latent constructs. The composite reliability coefficient of each latent constructs ranged from 0.932 to 0.960, with each above 0.70, signifying satisfactory internal consistency and reliability of the measures used in this study (Bagozzi & Yi, 1988; Hair et al., 2011).Table 4.1 further shows that Cronbach's Alpha of each latent variable

surpasses the recommended value of 0.7, indicating that the reliability of all constructs was adequate (Bagozzi & Yi, 1988; Hair, Anderson, Tatham, & Black, 1998).The assessment of the AVE presented in Table 4.1 shows that all values of AVE are greater than 0.5 signifying good convergent validity of the model.

Table 4.1 Internal Consistency and Reliability

Latent Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
ATUBE	0.903	0.932	0.775
IUOBE	0.935	0.950	0.792
OBEU	0.945	0.960	0.858
PEU	0.951	0.962	0.835
PUOBE	0.925	0.944	0.773

Sources: PLS SEM Algorithm

4.4 Discriminant Validity

The discriminant validity is the extent to which the construct differs empirically from one another. It is the rate of changes between one construct and the other (Hair et al., 2014). The estimation of the discriminant validity can be done through cross loading of indicators known as Fornell & Larcker criterion or Heterotrait-monotrait (HTMT) ratio of correlation. The Fornell & Lacker criterion for evaluating the discriminant validity compares the square root of the AVE $(\sqrt{\text{AVE}})$with the other latent constructs (Hair et al., 2014). Fornell & Lacker (1981) recommended that the latent constructs should explain the variance of its indicator. Thus, the square root of AVE $(\sqrt{\text{AVE}})$ should have a higher value than other latent constructs. Therefore, the correlations between the latent constructs of the model with were compared with the square root of AVE $(\sqrt{\text{AVE}})$ (Table 2). The findings indicate that all the square root of AVE were higher compared to the correlations between the latent constructs indicating adequate discriminant validity within the latent constructs (Fornell & Larcker, 1981).

Table 4.2 Discriminant Validity

Fornell-Larcker Criterion	ATUBE	IUOBE	OBEU	PEU	PUOBE
ATUBE	0.881				
IUOBE	0.619	0.890			
OBEU	0.840	0.577	0.927		
PEU	0.593	0.552	0.571	0.914	
PUOBE	0.715	0.617	0.685	0.683	0.879

Note: The square root of the AVE are the shaded values

The second method for measuring discriminant validity is examining the cross loadings of the indicators. This method requires that the loadings of each indicator on its construct are higher than the cross loadings on other constructs (Chin, 1998; Hair et al., 2014; Henseler et al., 2009). Chin (1998) recommends that all the indicator loadings should be greater than the cross-loadings. In line with the

recommendation of Chin (1998), Table 4.3 show the cross-loading of the model. The indicator loadings in the table relate with other indicators. The result presented shows that all the indicator loadings were higher than the cross -loadings suggesting that the discriminant validity is suitable for analysis in the model.

Table 4.3 Cross-Loadings of the constructs

Construct	ATUBE	IUOBE	OBEU	PEU	PUOBE
ATUBE01	0.904	0.561	0.794	0.500	0.648
ATUBE02	0.906	0.578	0.745	0.541	0.693
ATUBE03	0.895	0.575	0.753	0.567	0.646
ATUBE04	0.814	0.455	0.659	0.476	0.513
IUOBE01	0.470	0.899	0.385	0.396	0.457
IUOBE02	0.481	0.887	0.462	0.417	0.467
IUOBE03	0.594	0.942	0.533	0.516	0.573
IUOBE04	0.471	0.921	0.419	0.447	0.468
IUOBE05	0.654	0.794	0.667	0.599	0.685
OBEU01	0.790	0.532	0.921	0.510	0.616
OBEU02	0.768	0.540	0.933	0.555	0.636
OBEU03	0.758	0.503	0.915	0.506	0.622
OBEU04	0.795	0.562	0.937	0.543	0.662
PEU01	0.528	0.498	0.488	0.919	0.605
PEU02	0.521	0.525	0.476	0.931	0.623
PEU03	0.601	0.525	0.616	0.915	0.692
PEU04	0.551	0.523	0.537	0.908	0.614
PEU05	0.497	0.444	0.476	0.897	0.577
PUOBE01	0.683	0.614	0.643	0.646	0.910
PUOBE02	0.620	0.542	0.589	0.569	0.907
PUOBE03	0.650	0.545	0.609	0.617	0.915
PUOBE04	0.670	0.556	0.665	0.624	0.903
PUOBE05	0.499	0.439	0.486	0.543	0.748

Sources: PLS SEM Algorithm

4.5 Assessing the Significance Level of the Structural Model

The PLS-SEM generates T-statistics for testing of the structural model (inner and outer model) using a method called bootstrapping. Therefore, bootstrapping is a non-parametric process which permits the testing of statistical significance of different PLS-SEM results. The bootstrapping procedure has many advantages, as indicated below:

1. The method is very open and needs little mathematical knowledge or probability theory.
2. It depends on non-restrictive statistical assumptions.
3. Bootstrapping is generally used in situations where traditional systems may be difficult or unsuitable for measuring significance.

It is very simple to conduct bootstrapping within the PLS-SEM settings (Mooney & Duval,1993). This study, therefore, applied the standard bootstrapping technique with 500 bootstrap samples and 291 cases to evaluate the significance of the path coefficients of the model (Henseler et al., 2009; Hair et al., 2011; Hair et al., 2012). All the indicator loadings were higher than the cross -loadings suggesting that the discriminant validity is suitable for analysis in the model.

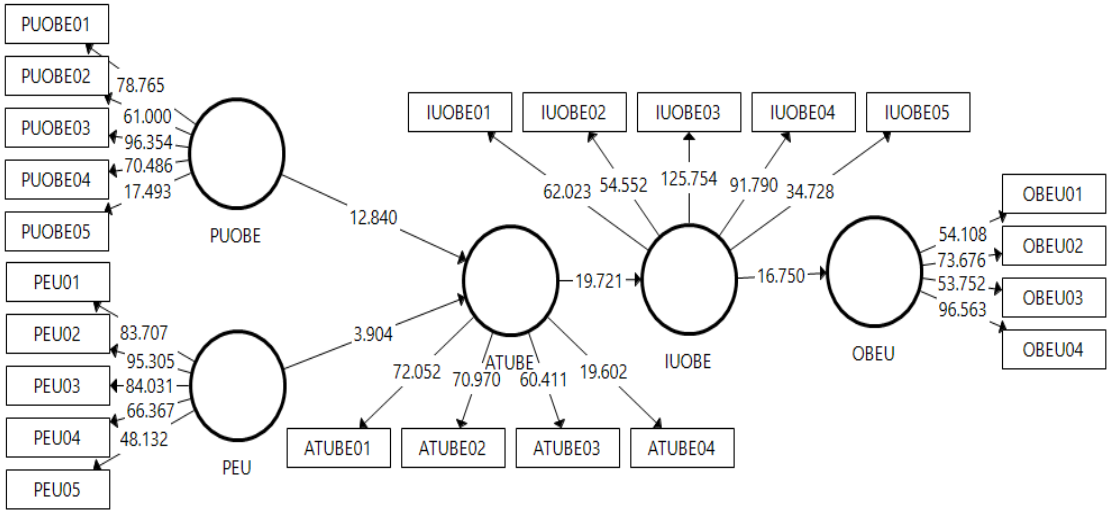

Figure 4.2 Structural Model
Source: PLS-SEM Output Bootstrapping Output

Table 4.4 presents the path coefficient, mean, standard error, T values and the p-values of the model variables. The result of the relationship between the study variables were tested and significantly confirmed as presented below. The result presented in Table 5 shows that there is a significant positive relationship between intention to use online banking and e-banking platform and online banking and e-payment usage (M = 0.578, t = 16.75, p < 0.05). Similarly, attitude toward the use of online banking has a significant positive impact on intention to online banking and e-payment platform (M = 0.620, t = 19.721, p < 0.05). Perceived usefulness of online banking and perceived ease of use has a significant positive relationship with attitude towards the use of online banking and e-payment (M = 0.583, t =12.840, p < 0.05; M = 0.196, t = 3.904, p< 0.05).

Hypothesis	The Latent Variables	Path Coefficient	Mean	SE	T-Values	P-Values
H1	IUOBE → OBEU	0.577	0.578	0.034	16.750	0.000***
H2	ATUBE→ IUOBE	0.619	0.620	0.031	19.721	0.000***
H3	PUOBE → ATUBE	0.581	0.583	0.045	12.840	0.000***
H4	PEU → ATUBE	0.196	0.196	0.050	3.904	0.000***

Table 4.4 Result of the Structural Model

Note: ***Significant at 1%,
**Significant at 5%,

4.6 Evaluation of Predictive Relevance

The coefficient of determination R^2 is frequently used as a measure of predictive power (Hair et al., 2012; Henseler et al., 2011). However, the R^2 provide inadequate information with regards to sample prediction (Sarstedt, Ringle, Henseler, & Hair, 2014). As a measure of predictive relevance, Stone-Geisser's Q^2 provides a standard for sample prediction (Geisser 1974). The Stone-Geisser method of predictive relevance is mostly used as a

substitute for goodness-of-fit in PLS-Path model research (Duarte & Raposo, 2010). Apart from the use of R^2, the predictive sample technique Q^2 can be efficiently used as a measure for predictive relevance (Stone 1974; Geisser 1975; Fornell & Cha 1994). Thus, Q^2 shows the degree to which an empirical data can be reconstructed with the aid of model and the PLS parameters to achieve the predictive relevance (Fornell & Cha 1994). The Q^2 can be obtained from two different types of prediction techniques; that is, cross-validated communality and cross-validated redundancy.

The cross-validated communality (Q^2) is the first prediction techniques designed by Stone-Geisser. It consists of key components of the PLS path model which assists in predicting the omitted data points. The Q^2 values are evaluated through the blindfolding method which measures the extent to which the path model can predict the originally observed values. During the estimations of Q^2, a blindfolding procedure was used to calculate the Q^2 by omitting one case at a time and re-estimating the model parameters based on the remaining cases and predict the omitted case values (Esposito Vinzi, Chin, Henseler, & Wang, 2010). The procedure results in the Stone-Geisser Q^2test statistics which shows how well-observed values are reconstructed by the model and its parameter estimates (Chin 1998). If $Q^2 > 0$, the model has predictive relevance. On the contrary, if it is $Q^2 < 0$, the model will lack predictive relevance. Thus, Q^2 can be used to measure the relative impact of the structural model on the observed measures for each dependent latent variable through cross-validation (Tenenhaus, Vinzi, Chatelin, & Lauro,200). Esposito et al. (2010) have suggested that the cross-validation communality can be calculated using the stone-Geisser criterion test Q^2 as follows:

$$\textbf{Stone} - \textbf{Geisser test criterion } Q_j^2 = 1 - \frac{\sum_k E_{jk}}{\sum_k O_{ik}}$$

Where:

$Q_j^2 = \textbf{Stone} - \textbf{Geisser test Criterion}$

$E_{jk} = \textbf{Squares of the predicting error}$

$O_{jk} = \textbf{Squares of the trivial pridiction error}$

On the other hand, cross-validated redundancy (Q^2) is the second Stone-Geisser's prediction techniques which is used for assessing the predictive relevance of the inner model. The inner model or structural model represents the relationships between the evaluated constructs or variables (Hair et al., 2014). The Cross-validated redundancy (Q2) assesses the predictive relevance of the inner model using a sample re-use technique excludes a part of the data matrix, calculates the model parameters and predicts the omitted part using the estimates. The smaller the difference between the original and predicted values, the greater the Q^2 and thus the model's predictive accuracy (Hair et al., 2014). Henseleret al. (2009) proposed that if the value of cross-validated redundancy is $Q^2 > 0$ for particular endogenous construct it indicates that the path models have predictive relevance. On the contrary, if it is $Q^2 < 0$, the construct in the inner model lacks predictive relevance. However, Rigdon (2014) and Sarstedt et al. (2014) did not say anything about the quality of the prediction. Cross-validated redundancy (Q^2) can be assessed using the following statistical formula:

$$Q_J^2 = 1 - \frac{\sum_G SSE_{JG}}{\sum_G SSO_{IG}}$$

Where: Q_J^2= Cross-validated redundancy

$\sum_G SSE_{IG}$ = Sum of squares of prediction errors for Block J

$\sum_G SSO_{IG}$ = Sum of squares of original data observationsfor Block J

As can be observed from Table 4.5, the result of the cross-validation redundancy was retrieved from blindfolding output of the PLS-SEM. The cross-validated redundancy evaluates the capacity of the model to predict the endogenous variables and explain the quality of the model. Thus, the cross-validation redundancy measures Q^2 for the endogenous latent variable online banking and e-payment usage (OBEU) was above zero. This is indicating the predictive relevance of the research models (Chin, 1998; Henseler et al., 2009).

Table 4.5 Constructs Cross-Validated Redundancy of the Research Models

	SSO	SSE	Q^2 (=1-SSE/SSO)
ATUBE	1,164.000	717.980	0.383
IUOBE	1,455.000	1,064.813	0.268
OBEU	1,164.000	852.701	0.267
PEU	1,455.000	1,455.000	
PUOBE	1,455.000	1,455.000	

Source: PLS-SEM Blindfolded output

5. Discussion

5.1 Evaluation of Research Findings

The major contribution of this research work is the combination of variables associated with technology acceptance constructs (perceived usefulness and ease of use) into a coherent model that jointly predicts costumer's attitude, intention to use online banking and e-payment services especially in a critical era of COVID-19. Drawing from the technology acceptance model, theoretically, the present study develops an extensive set of interrelationships between the variables by indicating the significance of the proposed model. The study contributes theoretically and empirically to the emerging online banking and e-payment literature by confirming a theory-driven research model of how all the research variables significantly influence intention to use online banking and use of e-payment services during the COVID-19pandemic. Jointly, the result of the study provides consistent empirical support for all the variables tested in the model. Firstly, the result suggested that intention to use online banking and e-payment services proved to be direct antecedents of using online banking and e-payment services during COVID-19. Suggesting that the customer believe that he will contact COVID-19 virus whenever he/she goes to banking hall or ATM machine, therefore he/she developed positive attitudes towards online banking and e-payment which influence him/her to use online banking and e-payment services. Thus, this is consistent with recent work in online banking and e-payment literature (Goyal, et al., 2013; Hong, Thong, & Tam, 2006; Kang et. al 2006 Kang, Hong, & Lee, 2009; Lee, Park, Chung, & Blakeney, 2012).Secondly, while Attitude is hypothesized as a direct antecedent of intention to use online banking and e-payment services, this finding validates explicitly its precise effects on intention to use online banking and e-payment services proposed in the study and proved by other studies (Alharbi, & Drew, 2014; Kuo, & Yen, 2009; Karahanna et al., 1999; Pavlou, 2003).Thirdly, perceived ease of use and usefulness have a significant effect on attitude towards the use of online banking and e-payment services, signifying that the technology acceptance model could also influence intention and use of online banking and e-payment services during COVID-19 pandemics.

5.2 Managerial implications

The study has a lot of managerial and practical implications. For instance, considering the emerging issue of lockdown and COVID-19 quarantine, using the online banking and e-payment system is the online alternative. However, many banks are facing serious challenge with regard to their customers' technology acceptance. Since customers playeda significant role in the banking business, the banks need to consider plight of the customer regarding their intention to use the banking and e-payment services. Therefore, the findings of this study to a large extent will assist the bank to reduce their cost of operation. Besides the main banking services, banks generate substantial revenue from the online banking and e-payment transaction because the services provide quick solution to their banking problem in a convenient manner. The results of this study provide needed information for promoting more financial product and services that meet the costumer's needs such as point of sales, cardless, and cashless payment system, online banking etc.

5.3 Limitations and suggestion for Future Research

One of the limitations of this study may be attributed to the cross-sectional nature of this study. Therefore, a longitudinal study will be required in the future to verify if behavioral intention changed over time and it may provide the opportunity to test the strength of the TAM model. Moreover, the use of non-probability sampling (convenience sampling) may which tend to limit the generalization of our findings to a wider scope. Future research should extend the findings of the present study by in-cooperating other theories which test the relationship between intention and behavior.

6. Conclusion

In conclusion, the present study examined the impact of COVID-19 on customers' online banking and e-payments usage. The results from the study suggested that intention to use online banking have a significant positive influence on online banking and e-payment usage. Similarly, attitude towards online banking have a significant positive impact on intention to use online banking and e-payment during COVID-19 pandemic. Perceived usefulness and perceived ease of use have a significant positive influence on attitude towards online banking and e-payment usage during COVID-19 pandemic. The findings of this study will assist the bank to reduce their cost of operation, generate substantial revenue from the online banking and e-payment transaction and encourage them to provide more financial product and services that may meet the costumer's needs in the future such as point of sales, cardless, and cashless payment system, online banking etc.

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Appendix

Online Banking & e-payment Usage

OBEU01Using the online banking enables me to accomplish e-payments quickly.
OBEU02Using the online banking allows me to make e-payments without spending time on making payment changes.
OBEU03Using the online banking permits me to make error-free e-payments
OBEU04Using the online banking requires minimal skills to complete e-payments
0BEU05 Using the online banking creates less trouble in the e-payment process that I conduct when compared to other payment methods.

Intention to use online banking &e-payment

IUOBE01I will use/continue using e-payment services in the future
IUOBE02Given the chance, I predict I will use/continue using e-payment services in the future
IUOBE03It is likely that I will use/continue using mobile payment services in the future
IUOBE04I intend to use online banking and e-payment services within the near future
IUOBE05I plan to use online banking and e-payment services

Perceived Ease of Using online banking & e-payment services

PEOU01Using mobile online banking and e-payment services will enable me to accomplish transactions more quickly.
PEOU02Using online banking and e-payment services will increase my productivity
PEOU03Using mobile payment services will enhance my effectiveness
PEOU04It would be easy for me to use online banking and e-payment services
PEOU05My interaction with online banking and e-payment services site would be clear and understandable.

Perceived Usefulness of Using online banking & e-payment services

PU01Using online banking and e-payment site would improve my performance in banking activities
PU02Using online banking and e-payment site would make it easier for me to do my banking activities
PU03Using online banking and e-payment site would enable me to accomplish banking activities more quickly
PU04I expect online banking and e-payment services will be useful in my life
PU05Using online banking and e-payment services will enable me to accomplish transactions more quickly