

MODELLING CONSUMERS' WILLINGNESS TO USE CARD-LESS BANKING SERVICES: AN INTEGRATION OF TAM AND TPB

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—Abstract—

This research seeks to fill the gap in online marketing literature by incorporating the theory of planned behaviour and technology acceptance model by examining the link between variables as well as exploring factors influencing non-users' willingness to use card-less banking services in South Africa. To validate the integrated conceptual framework, primary data were collected from 573 randomly selected banking consumers. A Structural Equation Modelling (SEM) technique was used to analyse data relating to hypothesised relationships in the model. The paper revealed that all the framework variables influence consumer willingness to use card-less banking services. The research paper describes both scholarly and managerial implications of the outcomes and suggestions for future directions for study.

Key Words: E-retail Banking, Technology Acceptance Model, Theory of Planned Behaviour

JEL Classification: M10, M16, M31

1. INTRODUCTION

Technology has been increasingly involved in service delivery in recent years. The use of technology in the delivery of banking services has become the basic operational component of today's banking organisations, allowing cost reduction and improving general operating efficiency (Xue & Hitt, 2011). Although, while technology-based services can be regarded as offering the potential solution for banks' survival in the modern digital age and offering competitive advantage, improving corporate efficiency can be accomplished through consumer recognition or innovation adoption. Several studies have analysed the adoption or acceptance of card-less banking services, however, there is a lacuna on variables that affect the implementation of card-less banking services. Card-less banking services can be described as the distant shipment of retail banking services.

Most South African banks waive bank charges on card-less banking services that are normally provided as bundled banking packages to encourage customers to adopt the service. This is in sharp comparison to in-bank physical transactions attracting high service charges. However, internet access is not an important obstacle to card-less banking implementation in South Africa, as a substantial percentage of account holders have access to the internet. According to the Internet World Stats (2019), out of a population of roughly 58 million (based on the 30 June 2019 estimate), and an internet penetration rate of 56.2 % percent, South African banks have the chance to reach roughly 36 million internet users.

The million-dollar question, however, is what drives customers to use card-less banking facilities in emerging economies? As a precedent of card-less banking acceptance, numerous researchers have suggested distinct factors. For example, some scholars have put forward psychological constructs such as consumer innovation, benefits, trust, self-efficacy, perceived risk, and attitudes to explain online adoption (Yee-Loong Chong, Ooi, Lin & Tan, 2010; Martins et al., 2014). However, some researchers, such as Kim et al. (2009), Lin (2011) and Al-Jabri and Sohail (2012), among others, consider innovation attributes such as perceived relative advantage, ease of use and compatibility, and knowledge-based trust (perceived competence, reliability) as explanations for the adoption of card-less banking by consumers, while studies such as the one conducted by Kesharwani and Singh (2012) have attempted to integrate the trust and perceived risk into TAM to explain internet banking adoption, the psychological and innovation attributes-behavioural intention linkages in relation to card-less banking services adoption remain under-researched.

In addition to this lacuna, there appear to be a dearth of studies that investigate these relationships from an emerging market perspective. The fundamental motivation behind this investigation is to fill this gap. In addition, to the best knowledge of the researchers, none or very few researchers have used Structural Equation Modelling (SEM) to test the causal relationships of the variables under investigation. Regarding the conceptual model proposed in this study, it can be noted that it is one of a kind, as there still remains a dearth of empirical evidence in studies that have tested the variables in the proposed model in relation to the South African context.

Premised on the identified research gaps, the current study investigates the influence of perceived benefit, perceived ease of use, social influence, perceived security, financial and performance risk on consumer willingness to use card-less banking services in South Africa. Over and above, the current study is expected to make academic and practical contributions to the existing services marketing literature and the practice of marketing communication in emerging markets, particularly in South Africa.

2. LITERATURE REVIEW

2.1. Theory of planned behaviour (TPB)

The theory of planned behaviour (TPB) advocates that the fundamental factor in individual behaviour is behavioural intention, which is affected by attitude toward the behaviour, subjective norm, and perceived behavioural control (Ajzen, 2002). Subjective norm (SN) expresses the perceived social pressure of a person who intends to perform the behaviour in question. Explicitly, the subjective norm is relative to normative beliefs about the expectations of significant others. Perceived behavioural control (PBC) concerns beliefs about the existence of control factors that may assist or deter their performing the behaviour. Several studies validated the applicability of TPB to various content domains (Ajzen, 2001). There is significant empirical evidence suggesting that TPB efficiently explicates individual intentions and behaviour in adopting new information technologies which, in this case, is the use of card-less banking services.

2.2. Technology acceptance model (TAM)

Numerous researchers have applied Technology Acceptance Model (TAM) to illustrate an individual's acceptance of new Information Technology (IT) and have ascertained that the perceived usefulness and the perceived ease-of-use are the key variables of individual acceptance (Schierz, Schilke & Wirtz, 2010;

Martins, Oliveira & Popovič, 2014). However, these two factors may not precisely reflect the acceptance of card-less banking use. Using TAM and TPB as theoretical bases, this study has theorised and examined an integrated model to explain various factors affecting individual usage of card-less banking in South Africa. Integrating the traditional constructs of TAM, perceived ease of use and perceived benefit, and the TBP constructs of social influence and behavioural intention, new constructs of perceived financial risk, perceived security risk and perceived performance risk have been added to the model. The *raison d'être* behind incorporating perceived risk in the model is to draw managerial attention to the critical challenges and to proffer safe and secure virtual environments that empower customers to make absolute use of card-less banking services.

2.3. Card-less banking characteristics

Card-less banking services enable customers to transfer funds electronically, either for under-banked or banked, using an ATM, self-service kiosk, mobile or internet banking (Kinsman, 2019). Moodley-Isaacs (2011) adds that card-less facilities provide access to banking services for customers, such as transferring money to people, regardless of whether they are banked or not. Innova (2015) also relates to card-less banking is a service that enables customers to allow another person to withdraw cash from an ATM without using a card. It can therefore be concluded that card-less banking facilities are a platform that offers access to banking services to people without the need for a card to be used. Other forms of card-less banking, including ATMs, self-service kiosks, mobile apps, and internet banking, may be used by consumers to access their accounts and make transactions using their own personal details to obtain access (Kinsman, 2019). Four types of card-less banking facilities are accessible, including withdrawal of cardless money, mobile banking, internet banking, and biometric banking. Card-less money withdrawal is a facility allowing account holders to withdraw money from an account without an eligible card being used (Istrate 2014). Mobile banking is a scheme that enables a financial institution's customers to perform multiple financial transactions using mobile devices such as cell phones and tablets (Asfour & Haddad 2014). Chavan (2013) describes internet banking as the use of an internet-connected device for the purpose of making payment orders, transfers, exchanges and viewing the account status. Biometric banking enables the use of biometric authentication technology to verify physiological features such as a consumer's voice, fingerprint or iris identification on their mobile banking equipment to obtain access to their accounts and to execute their required financial transactions (Bhosale & Sawant 2012).

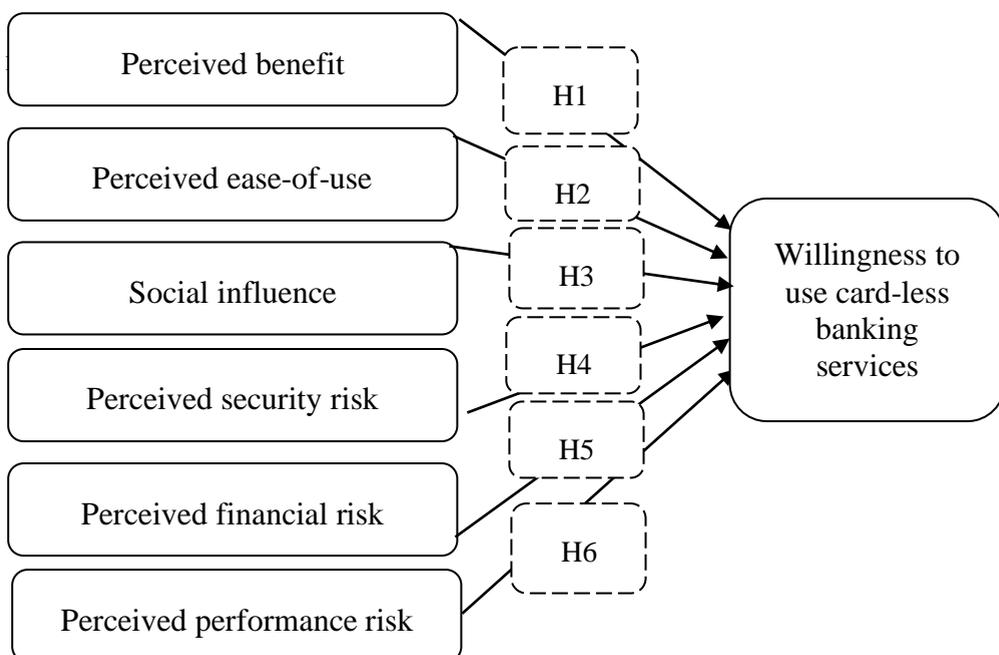
2.4. Willingness to use card-less banking services

Willingness to use card-less banking services is the key dependent variable of the model, derived from TPB, that hypothesises that behavioural intentions are the main predictors of actual behaviour (Ajzen, 1991). This paper describes the willingness to use as the inclination of the individual to use or reuse the bank's transactional card-less banking services. Several studies have recognised behavioural variables affecting individual internet buying intentions such as self-efficacy (Amaro & Duarte, 2015); word of mouth (Erkan & Evans, 2016). The adoption of elements from TAM, TRA, TPB to explain and predict behavioural intention and subsequently, the actual behaviour, is of the greatest significance. The hypothesis is that intentions capture the motivational variables influencing real behaviour, hence the greater the desire to participate in behaviour, the greater the performance. In this research, the willingness to use card-less banking services is the power of the consumer's intention to use and/or reuse card-less banking services in a banking transaction.

3. Conceptual model and hypothesis development

This research integrates TAM and TPB into a comprehensive structure to examine customers' card-less banking service intention and adoption. To empirically test the interrelationships between constructs, a conceptual model was developed, based on the reviewed marketing, and especially consumer behaviour, literature. This conceptualised research model is shown in Figure 1.

Figure 1: Conceptual Model



3.1. Perceived benefit and behavioural intention

Perceived benefit is the extent to which a customer thinks that using an innovation will improve his or her efficiency. In this research, perceived benefit is classified as comfort associated with the extrinsic benefits of using card-less banking facilities (i.e. service-side). However, research shows that elevated rates of perception of benefits towards an item accelerate a consumer's behavioural orientation. Therefore, this study seeks to empirically explore the connection between perception of advantages and readiness to use card-less banking services.

H1: Perceived benefit positively affects willingness to use card-less banking services.

3.2. Perceived ease-of-use and behavioural intention

Perceived ease-of-use is conceptualised as an individual's evaluation of the rational effort involved in the use of information technology (IT) (Venkatesh, Thong & Xu, 2012). Venkatesh (2000) found several determinants of perceived ease-of-use by integrating internal control (computer self-efficacy) and external control (facilitating condition) into TAM. Existing literature indicates that perceived ease-of-use has a positive and significant effect on perceived usefulness in the context of online banking (Lee, 2009; Martins, Oliveira & Popovič, 2014). Customers are therefore more likely to use card-less banking services if the process is user-friendly, which can be influential using technology. It can therefore be hypothesised that:

H2: Perceived ease-of-use positively affects willingness to use card-less banking services.

3.3. Social influence

Several studies have commonly recognised the impact of social influence on behaviour in accepting technology. While several researchers have argued that the structure has restricted conceptualisation owing to its focus on the normative portion of societal views rather than broader societal contexts, Conner and Armitage (1998) and Terry and Hogg (2000) claim the opposite and this is the suggestion to further test the theoretical connection between social influence and adoption of technology. While TPB has a direct connection between subjective norm and purpose, TAM breaks down subjective norm into two further theoretical constructs: internalisation and picture (Venkatesh & Davis, 2000). Internalisation is an informational social influence, defined as the absorption of data by the individual as proof of truth, arising from normative views and behavioural values

developed by other people, organisations, or society. In the present context, if a colleague / family member recommends the use of card-less banking services as a banking channel in a positive way, an individual may also think in its usefulness and readiness to use it in turn. From the inferences, therefore, we hypothesise:

H3: Social influence positively affects willingness to use card-less banking services.

3.4. Perceived risk

Perceived risk is described as the uncertainty and unfavourable effects connected with the expectations of customers (Kesharwani & Singh Bisht, 2012). Perceived risk therefore represents the perception of the consumer about the degree of subjective uncertainty of results. The spatial and temporal separation between customers and retail banking in internet services generates implicit uncertainty about banking operations (Al-Gahtani, 2011). Thakur and Srivastava (2014) evaluated perceived danger as a factor of second order and their findings endorsed the hypothesis that risk adversely impacts the intention of adoption. However, some studies have endorsed, and dismissed in others, the impact of perceived danger on the intention of adoption (S'anchez-Fern'andez, & Mu al-noz-Leiva, 2014; Wang & Yi, 2012). This research therefore focuses on perceived risk of card-less banking services and suggests:

H4: Perceived security risk negatively affects willingness to use card-less banking services

H5: Perceived financial risk negatively affects willingness to use card-less banking services.

H6: Perceived performance risk negatively affects willingness to use card-less banking services.

4. METHODOLOGICAL ASPECTS

For this study, the research philosophy was positivism. A quantitative research method has therefore been used for this study. The design was appropriate for requesting the necessary data on perceived benefit, perceived ease-of-use, social influence, perceived security risk, perceived financial risk, perceived performance risk and consumer willingness to use card-less banking services. Furthermore, the strategy allows one to investigate the causal relationships with the constructs used in the research.

4.1. Sample and data collection

The target population for this study was South African consumers in Gauteng who hold a bank account. A mall intercept survey was used. Four shopping malls in Johannesburg were selected for the survey. Of the total, 573 usable questionnaires were retrieved for the final data analysis, representing a response rate of 84 per cent. The research participants consisted of a slightly higher proportion of females than males. To eliminate differences in response patterns due to different reference points, all respondents were encouraged to answer the questionnaire with reference to card-less banking services with guidance from research assistants.

4.2. Measurement instrument and questionnaire design

Research scales were operationalised based on extant work. Proper modifications were made to fit the current research context and purpose. Section A of the questionnaire elicited general and biographical information about respondents. Perceived benefit was measured through questions adapted from Matikiti, Mpinganjira and Roberts-Lombard (2017). Additionally, perceived ease of use was assessed by questions adapted from Davis (1989). Social influence was also measured through questions adapted from Matikiti, Mpinganjira and Roberts-Lombard (2017). Questions on perceived security risk were adapted Hanafizadeh and Khedmatgozar (2012). In addition, perceived financial risk was also assessed using six items adapted from Hanafizadeh and Khedmatgozar (2012). Furthermore, questions on perceived performance risk were measured from items adapted from Artuğer (2015). Finally, intention to use card-less banking services was assessed using nine items adapted from Ali (2011). All measurement items were measured on a five-point Likert-scale and the scale indicators were affixed to a strongly disagree (1) to strongly agree (5) Likert-scale continuum.

5. RESULTS

5.1. Descriptive Statistics

The respondents were predominantly females (56.4 per cent). The median age group of the respondents was less than 28 years (41.4 per cent). 77% of the respondents had medium or easy access to internet and 53% had medium internet usage skill while 78% mostly use the Internet for more than three hours per week.

5.2. STRUCTURAL MODEL RESULTS

5.2.1. Data Analyses and results

A two-step procedure was applied to analyse the data (Anderson & Gerbing, 1988). Thus, the accuracy of multi-item construct measures was assessed followed by a test of the research model and hypotheses. In this study, a structural equation modelling (SEM) approach using AMOS (25) statistical software was used to test the posited hypotheses in the conceptual model.

5.2.2. Measurement accuracy analyses

To examine the reliability and validity of the multi-item measures, confirmatory factor analysis (CFA) was performed. Preliminary specification search led to the deletion of some of the items in the constructs scale to provide acceptable fit. The overall model fit in both measurement and structural models was observed using goodness-of-fit indices. Recommended statistics for the overall model assessment indicated an acceptable fit of the measurement model of data, that is: $\chi^2/(\text{df}) = 1.724$; CFI=0.968; TLI=0.959; IFI= 0.968; RMSEA=0.052 (Hair, Ringle & Sarstedt, 2011).

5.2.3. Reliability and validity measures

Composite reliability (CR) and Average Variance extracted (AVE) for each construct were calculated using the formulae proposed by Fornell and Lacker (1981). Based on the results shown in Table 1, the values were above the recommended thresholds (Hair et al., 2010), therefore indicating the presence of convergent validity and validating an outstanding internal consistency and reliability of the measurement instruments used, with more than 60% of each item's variance shared with its respective construct. Discriminant validity was established through comparison of shared variance between constructs with the average variance extracted for each multi-item construct (Nunnally & Bernstein, 1994). Using the squared multiple correlation (SMC) to the variance of each indicator variable, all values of SMC are greater than the threshold of 0.30 (Bagozzi & Yi, 1988); Cronbach alpha values are more than the acceptable cut-off criterion of 0.7 (Hair et al., 2010)

Table 1: Accuracy Statistics Analysis

Research Construct	Item	α	C.R.	AVE	λ	SMC
Intention to use card-less banking services (ITU)	ITU1				0,915	0,837
	ITU2				0,886	0,785
	ITU3				0,835	0,697
	ITU4	0,934	0,91	0,76	0,895	0,801
Perceived Benefit (PB)	PB1				0,678	0,460
	PB2				0,689	0,475
	PB3	0,788	0,75	0,61	0,862	0,743
Perceived ease-of-use (PEOU)	PEOU1				0,908	0,824
	PEOU2				0,753	0,567
	PEOU3	0,860	0,81	0,58	0,769	0,591
Social influence (SI)	SI1				0,661	0,437
	SI2				0,861	0,741
	SI3				0,924	0,854
	SI4	0,898	0,91	0,71	0,896	0,803
Perceived security risk (PSR)	PSR1				0,811	0,658
	PSR2				0,854	0,729
	PSR3	0,810	0,82	0,60	0,652	0,425
Perceived Financial risk (PFR)	PRF1				0,757	0,573
	PRF2	0,719	0,55	0,55	0,743	0,552
Perceived performance risk (PPR)	PPR1				0,770	0,593
	PPR2	0,742	0,59	0,59	0,767	0,588

NOTE: CR: Composite Reliability; AVE: Average variance extracted; λ =standardized factor loading; SMC = squared multiple correlation; α =Cronbach alpha;

*Scores: 1- strongly Disagree 3-Neutral 5- Strongly Agree

Measurement CFA model Fit: $\chi^2/ (df) = 2.222$; GFI=0.881; CFI=0.945; TLI=0.931; IFI= 0.945 and RMSEA=0.067.

5.3. Research model assessment and hypotheses testing

The results of the structural model indicate adequate fit with the observed data, compared with the suggested fit criteria. The individual hypothesis testing results as shown on Table 2 indicate the following path co-efficient: H1 (0.315), H2 (0.901), H3 (0.225), H4 (-0.088), H5 (-0.097) and H6 (0.028). All the hypotheses coefficient values were significant, except for H6. Therefore, these results provide support for all the proposed hypotheses, except hypothesis six (6). Given the non-significance of perceived performance risk on behavioural intention, H6 is rejected.

Table 2: Analysis of the research structural model related hypothesis

Path	Hypothesis	Path Coefficient Values β	P value	Result
PB-> ITU	H1	0,901	***	Supported and significant
PEOU-> ITU	H2	0,315	***	Supported and significant
SI-> ITU	H3	0,225	***	Supported and significant
PSR-> ITU	H4	-0,088	0,024*	supported and significant
PFR-> ITU	H5	-0,097	0,054*	supported and significant
PPR-> ITU	H6	0,028	0,587	Not supported and Insignificant

NOTES: *significance level<0.05; ** significance level<0.01; ***significance level <0.001; ns- not significant

Research structural model fit: $\chi^2 / (df) = 1.921$; CFI=0.958; GFI=0.901; TLI=0.948; IFI= 0.958; RMSEA=0.058

Notably, hypotheses H1, H2, H3 H4 and H5 are found to be positive and significant. By implication, this finding indicates that the individual's willingness to use card-less banking services could be affected positively by perceived benefit (H1), perceived ease-of-use (H2) and social influence (H), and negatively by perceived security risk (H4) and perceived financial risk. However, this is contrary to Wu and Wang's (2005) finding which found a positive relationship between risk perception and behavioural intention to use online commerce, specifically mobile commerce. The positive relationship between perceived ease-of-use and intention to use card-less banking service can be attributed to the assertion that perceived ease-of-use has a direct and significant effect on behavioural intention to use an online service when the consumer has little or no direct experience with the specific system. Mostly, consumers change their ease-of-use perception about a specific service over time after experiencing, and frequently transacting, using the service.

6. DISCUSSION AND CONCLUSIONS

This paper creates a wide range of interrelationships between variables theoretically and examines their relative impact on consumer willingness to use card-less services for banking transactions. Specifically, this research postulates that consumers' perception of use benefit significantly affects their willingness to use card-less banking services in a positive way while their perception of risk negatively impacts on their intention to use the card-less services. The research findings confirm the TAM relationship hypothesised by Davis (1989) and other extant literature that supports the assertion that PEOU is an antecedent of behavioural intention (Venkatesh & Davis, 2000; Wang et al., 2008). This research draws similarities between perceived behavioural control (Ajzen, 2002) and perceived performance risk (PPR) in that both depend on volition. The study results indicate that behavioural intention to use card-less banking services is also influenced by security risk and financial risk perception. Contrary to Ajzen (2002), the study found that there is no significant relationship between intention to use card-less banking services and perceived performance risk hence H6 is rejected.

7. IMPLICATIONS

This research discovered that consumers' risk perception, except performance risk, affect their willingness to use card-less e-retail banking services. The findings indicate that reducing risk perception will positively change consumers' attitude towards e-retail banking. Overall, this study found that as much as ease-of-use, social influences are important factors, perceived risks are equally critical in influencing an adoption of an innovation. Therefore, reducing risk perception should also be a priority. Better understanding of consumer risk/benefit perceptions of card-less banking can provide a useful marketing tool to maximise consumer experiences with online transactions. This study further found that perceived benefit, perceived ease-of-use, social influence, perceived security risk and perceived financial risk drive consumers' willingness to use online card-less banking services. Although the loadings were not very distinct, this research discovered that perceived benefit is more influential than perceived ease-of-use in affecting the implementation of card-less banking facilities.

8. LIMITATIONS

As this research attempted to explain the impacts of consumers' risk/ benefit perceptions on behavioural intention, there were a few constraints. These constraints indicate additional research. This research concentrated on the immediate effects of dependent variables. Further studies may define mediating and/or moderating factors that further explain the variance in interactions between consumer perceptions of risk / benefit and behavioural intention. Second, this research tested the suggested model with information gathered from one significant province. Therefore, gathering information from a more varied group of individuals in distinct geographic areas would increase the usefulness of the data.

9. CONCLUSION

The purpose of this research was to investigate the impact of perceived benefit, perceived ease-of-use, social influence, perceived security risk, perceived financial risk, perceived performance risk on consumer willingness to use card-less banking services in South Africa. In addition, the study validates the assumption that factors such as perceived benefit, perceived ease-of-use, social norms, perceived security, financial and performance risk are instrumental in stimulating consumer willingness to use card-less banking services. A robust relationship was also found on the nexus between perceived benefit and consumer willingness to use card-less banking services. Managerial implications of the

findings were discussed, and limitations and future research directions were indicated. This study contributes, above and beyond, new knowledge to the existing African setting on consumer behaviour literature – a research context that is neglected in academia.

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