

## Exploring the Determinants of Cell Phone Banking Adoption in Botswana

Rina Makgosa<sup>1</sup> and Neo Kootsholetse<sup>2</sup>

<sup>1</sup>University of Botswana, E-mail: Makgosa@mopipi.ub.bw

<sup>2</sup>First National Bank Botswana

### ABSTRACT

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*The adoption of cell phone banking is one of the innovative ways for improving competitive advantage and ensuring customer satisfaction in the banking industry. The current study investigated factors that influence the adoption of cell phone banking in Botswana, a context that has not been investigated before. In particular, a convenience sample of 200 bank customers was targeted using a self-administered structured questionnaire. Findings reflected that adoption of cell phone banking in Botswana is significantly and positively influenced by perceived usefulness, perceived ease of use, and amount of information received. Perceived risk had a significant and negative effect on cell phone adoption. However, on the contrary, respondents are likely to adopt cell phone banking even if they do not have to try it first. Results of the current study demonstrate that it is important for banks to provide more information about cell phone banking. Marketing communication programmes need to emphasize the usefulness, ease of use of cell phone banking as well as security issues.*

**Key Words:** Cell phone banking adoption, perceived ease of use, perceived usefulness, perceived risk, trialability.

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### BACKGROUND

A significant number of consumers have adopted cell phones in Botswana. According to Baxter (2006), Botswana has one of the largest numbers of cell phone users in Africa. Cell phone users stood at 2, 645 000 as at December 2010, which is about 147% of the entire population (Otebetse, 2011). The adoption of cell phone services has been rapid in the banking industry in many parts of the world. Cell phone services offer banks innovative ways of meeting diverse needs of banking customers (Brown et al., 2003; Laukkanen, 2007) or handling daily banking transactions efficiently (Pikkarainen, et al., 2004). Nonetheless, in order for banks to enjoy the full benefits of cell phone services it is imperative that consumers are willing to accept the banking innovation. Past studies have investigated the various product features or characteristics that facilitate adoption of cell phone banking in Asia (Laforet and Li, 2005; Lurn and Li, 2005), Europe (Laukkanen, 2007; Lee et al., 2003); and South Africa (Brown et al., 2003).

However, cell phone banking is in the introductory phase in Botswana in spite of the

rapid adoption of cell phones. In fact, two of the oldest banks in Botswana (i.e., Barclays and Standard Chartered Bank) launched cell phone banking in 2009 while First National Bank is the first to introduce cell phone services more than six years ago (Mosinyi, 2009). In addition, other than a notable study conducted on cell phone adoption in South Africa, there is a knowledge gap on the adoption of cell phone banking in the Southern African context. Thus, the purpose of the current is to add to the understanding of cell phone banking adoption, by investigating factors that influence the adoption of cell phone banking in Botswana. Knowledge on the adoption of cell phone banking would give insight into how such innovative banking services can be marketed to enhance widespread acceptance or usage among consumers.

## PREVIOUS RESEARCH

Cell phone banking is a form of banking whereby consumers access their bank accounts through their cell phones. Cell phones are an integral part of customers' lives and are also equipped with internet connectivity. In particular, from their cell phones, consumers are able to access their accounts, check balances, get a mini statement (showing last three transactions), make transfers, pay bills and other transactions (Brown et al., 2003). Cell phone banking also offers customers advantages such as location free convenience, cost effectiveness and access to service regardless of time (Laukkanen, 2007). Despite the unique features and advantages that customers could enjoy from cell phone banking, its adoption by consumers has remained relatively slow.

Adoption is the acceptance and continued use of a new product (Schiffman and Kanuk, 2010). An appraisal of the literature has identified two theories that are commonly employed in research investigating consumer adoption of banking innovations including the Technology Acceptance Model and Diffusion of Innovation Theory. Technology Acceptance Model originally proposed by Davis (1989) identified two determinants influencing acceptance of an innovation (Amin, 2008; Pikkarainen et al., 2004; Wang et al, 2003). This model posits that user's adoption of an innovation is determined by the perceived usefulness and perceived ease of use. The Diffusion of Innovations Theory which was originally formulated by Rogers (1983) states that consumers adopt an innovation because of certain product characteristics including relative advantage, complexity (opposite of perceived ease of use), compatibility, observability, and trialability (Lee et al., 2003; Polatoglu and Ekin, 2001). The current study draws determinants of cell phone banking from both the technology acceptance model and the diffusion of innovations theory. Thus, in the current study, seven innovative attributes of cell phone banking have been considered namely: (1) perceived usefulness, (2) perceived ease of use, (3) relative advantage, (4) compatibility, (5) trialability, (6) amount of information received and (7) perceived risk. These factors are briefly discussed below.

### Perceived Usefulness

Perceived Usefulness has been defined as the extent to which a person believes that using an innovation will enhance his or her job performance (Amin, 2008; Davis, 1989; Pikkarainen et al., 2004). Previous studies have demonstrated that perceived usefulness significantly and positively influence the adoption of cell phone banking (Laurin and Li, 2005), internet banking (Pikkarainen et al, 2004; Wang, et al., 2003); E-commerce (Lee et al., 2000) and cell phone credit cards (Amin, 2008). In particular, consumers are more likely to adopt or use an innovation when it provides unique features or benefits such as convenience, low costs, ease of making payments and investment. By applying these findings in the context of cell phone banking, it is hypothesized that:

*H1: The greater the perceived usefulness of using cell phone banking in Botswana, the more likely that it will be adopted.*

### **Perceived Ease of Use**

Perceived ease of use is the degree to which a person believes that using an innovation would be free of effort (Davis, 1989). Past research has shown that perceived ease of use has a significant and positive effect on the adoption of cell phone banking (Laurin and Li, 2005), E-commerce (Lee et al., 2003), behavioral intentions to adopt internet banking (Wang et al., 2003) and cell phone credit cards adoption (Amin, 2008). In other words, consumers are likely to adopt an innovation when it is perceived to be easier to use and less complex when buying online, making banking transactions online or when using cell phone cards for making payments. However, the degree to which a new product is difficult to understand or use did not affect the adoption of cell phone banking (Brown et al., 2003) and internet banking (Pikkarainen et al. 2004). Although findings on the relationship of perceived ease of use and adoption of innovations tend to differ, it is hypothesized that:

*H2: The higher the perceived ease of use for cell phone banking in Botswana, the more likely that it will be adopted.*

### **Relative Advantage**

Relative advantage is defined as the degree to which potential customers perceive a new product as superior to other existing alternatives (Schiffman and Kanuk, 2010). Researchers have indicated that relative advantage is one of the likely factors to influence adoption of various innovations such as cell phone banking (Brown et al, 2003; Lee et al., 2003; Lin, 2010), mobile internet (Hsu et al., 2007), e commerce (Lee et al, 2003) and internet banking (Polatoglu and Ekin, 2001). This suggests that the greater the perceived advantage that an innovation offers over other forms in terms of price, convenience and performance, there will be an increased certainty that it will be adopted. Thus, the hypothesis is,

*H3: The greater the perceived relative advantage of using cell phone banking in Botswana, the more likely that it will be adopted.*

### **Compatibility**

Compatibility refers to how well a technology fits with an individual's present working lifestyle, values and needs (Schiffman and Kanuk, 2010). Hsu et al., (2007) has shown that when consumers perceive mobile internet to be compatible with their lifestyles, needs and values the more likely it will be adopted. Similarly, Polatoglu and Ekin (2001) found that Turkish consumers were less likely to adopt internet banking because it was perceived as less compatible with their values and needs. However, compatibility was found to have no significant influence on cell phone banking adoption in South Africa (Brown et al., 2003). Despite the mixed findings, it is hypothesized that

*H4: The greater the perceived compatibility of cell phone banking with values, needs and lifestyles of Consumers in Botswana, the more likely that it will be adopted.*

### **Trialability**

Trialability is the degree to which an innovation can be tried first before adoption (Schiffman and Kanuk, 2010). Trialability was found to positively affect the adoption of cell phone banking in South Africa (Brown et al, 2003) and mobile internet (Hsu et al., 2007). Thus

it is hypothesized that:

*H5: The greater the trialability related to cell phone banking in Botswana, the more likely that it will be adopted.*

#### **The Amount of Information Received**

Amount of information received has been found to have a positive effect on innovations such as online banking services (Pikkarainen et al. 2004; Sathye, 1999) and cell phone credit cards adoption (Amin, 2008). In particular, Sathye (1999) demonstrated that when consumers are unaware of the features, benefits and advantages of online services they are less likely to adopt online services. Similarly, Amin (2008) indicated that when a consumer does not have adequate and accurate information concerning cell phone credit cards there is a lower possibility that he or she will adopt cell phone credit cards. Previous findings have shown that potential consumers need to be made more aware of the features, benefits and advantages that innovations would offer over other existing channels such as banking physical branch or Automated Teller Machines. Thus it is hypothesized that:

*H6: The greater the amount of information received on cell phone banking in Botswana, the more likely that it will be adopted.*

#### **Perceived Risk**

Perceived risk is the degree of uncertainty or anxiety about the consequences of a purchase that a consumer feels when considering the purchase of a new product (Schiffman and Kanuk, 2010). Perceived security risk has been found to encourage the adoption of cell phone banking (Brown et al, 2003; Larofet and Li, 2005; Lee et al., 2003). In particular, consumers showed great concern about the security and safety of using cell phones in banking in South Africa (Brown et al., 2003) China (Larofet and Li, 2005) and United Kingdom (Lee et al. 2003). However, Laukkanen (2007) found that consumers in Finland perceived cell phones as secure and safe for conducting banking transactions. Despite the conflicting findings it is hypothesized that

*H7: The lower the perceived risk of using cell phone banking in Botswana, the more likely that cell phone banking will be adopted.*

## **RESEARCH METHOD**

In order to address the hypotheses specified in the current study, a survey research design was used. The research focused on the students of the University of Botswana as most of the government sponsored students are also clients for First National Bank. Students are also a reasonable unit of analysis since it is mainly the young and educated who are technologically savvy and who are likely to have a high level of awareness of a new innovation such as cell phone banking (Brown et al, 2003; Laforet and Li, 2005). Additionally, students are widely used since their demographic characteristics are relatively similar, which reduces the potential for random errors which is common with samples of the general public (Calder et al., 1982). Data was collected from a convenience sample of 200 respondents using a self administered structured questionnaire. Convenience sampling has been commonly used in previous related research despite its known limitations (Amin, 2008; Brown et al, 2003; Laforet and Li, 2005). Fifty-eight percent (n = 116) of the sample were males while forty-two percent (n = 84) were females.

To measure the various factors influencing the adoption of cell phone banking a scale

of a total of 23 items adapted from Davis (1989) and Tan and Teo (2000) was used. It should be noted that both Davis (1989) and Tan and Teo (2000) had the same factors that were worded differently, hence an item would be selected from either one of the authors based on the objectivity of the researchers. In particular, three items were used to measure each of the following factors: perceived ease of use, perceived risk, trialability, amount of information needed and compatibility while four items were used for perceived usefulness and relative advantage. Respondents were asked to indicate the degree of their agreement with the statements on a 5 point Likert scale ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree". To measure adoption of cell phone banking, a single item was used and it was structured on a five-point scale ranging from 1 = "Definitely did not use it" to 5 = "Definitely did use it".

## FINDINGS

### Dimensionality of the Determinants of Cell Phone Banking Adoption

The dimensionality of the factors affecting the adoption of cell phone banking was tested using Exploratory Principal Component Factor Analysis with Varimax Rotation on the entire sample (n = 200). To identify those factors that are meaningful, individual items were considered for elimination using a number of criteria. Particularly, Eigen values greater than one and factor loadings of .30 and more on a factor were used as they are considered as good discriminatory measures (Bryman and Crammer, 1998). The exploratory factor analysis results, of the factors affecting the adoption of cell phone banking are presented in Table I.

Out of the twenty-three items used to measure determinants of cell phone banking adoption, eighteen items were retained. Thus, five items were deleted as they loaded equally in more than two factors. The final factor analysis based on eighteen items generated five factors with Eigen values greater than one. The five factors explained 59.99% of total variances and were labeled as *Perceived Usefulness*, *Perceived Ease of Use*, *Trialability*, *Amount of Information Received* and *Perceived Risk*. Two factors did not emerge in the current study: *Relative Advantage* and *Compatibility*.

Next, the reliability of the items representing the five factors affecting the adoption of cell phone banking was tested using Cronbach Alpha. The Reliability tests show the following Cronbach Alpha values: *Perceived Usefulness* = .86, *Perceived Ease of Use* = .69, *Trialability* = .73, *Amount of Information Received* = .74, and *Perceived Risk* = .59. Cronbach Alphas equal or higher to the cut-off alpha value of .50 were used as an indicator of reliability in a study by Brown et al, (2003). From the above Cronbach Alpha values it can be seen that the indicated factors can be viewed as reliable because they contain values that are greater than .50 which meets the requirements for basic survey research.

### Hypotheses Testing

Before the hypotheses specified in this study were tested, descriptive statistics were used to analyze perceptions of cell phone adoption and its determinants. The results on cell phone adoption revealed that 61% (n = 122) of respondents indicated that they had used cell phone banking in the last twelve months whereas 39% (n = 80) responded that they had not used cell phone banking. Descriptive statistics of each determinant of cell phone banking adoption show that overall respondents perceived cell phone banking to be useful, easier to use and less risky. Respondents also felt that the adoption of cell phone banking could be increased if it could be tested first before use and if more information about cell phone banking is provided. Furthermore, results of t-tests show that consumers' perceptions about the various factors of



cell phone banking vary between non users and users. In particular, users seem to perceive cell phone banking as more useful, easy to use and require more information than non-users. In contrast, non-users perceive cell phone banking as more risky and would like the opportunity to try cell phone banking before use than users.

In order to test H1 to H7, Multiple Linear Regression Analysis using the Stepwise Method, was employed. Two hypotheses, H3 and H4 were not tested as the factors did not emerge from the exploratory factor analysis. Based on the results of regression presented in Table 3, H1, H2, H6 and H7 were supported while H5 was rejected. In particular, the results in Table 3 show that as expected, when cell phone banking is perceived to be useful, easy to use, less risky and more information is provided, consumers are more likely to adoption it. However, results also indicate that even though trialability is important especially among non users, respondents are more likely to adopt cell phone banking even if it has tried it first.

**Table 1: Dimensionality of Factors Influencing the Adoption of Cell Phone Banking**

	<b>Factor Loadings</b>	<b>Means (SD)</b>	<b>% of Variance</b>
<b>Factor 1: Perceived Usefulness</b>			28.99
Using cell phone banking makes it easier for me to conduct payment transactions.	.86	3.74 (.97)	
Using cell phone banking enhances my effectiveness in conducting payment transactions.	.83	3.72 (1.03)	
I find cell phone banking to be useful in the payment of my transactions.	.82	3.64 (1.08)	
Using cell phone banking improves my performance in conducting payment transactions.	.76	3.56 (.97)	
Cell phone banking allows me to manage my finances more effectively.	.66	3.35 (1.17)	
Cell phone banking is quicker to use than traditional forms of banking.	.60	4.10 (.88)	
<b>Factor 2: Perceived Ease of Use</b>			11.61
Cell phone banking is complex to use.	.81	2.42 (1.04)	
Cell phone banking requires a lot of mental effort	.73	2.18 (.92)	
Cell phone banking is frustrating.	.63	2.38 (.97)	
<b>Factor 3: Trialability</b>			8.34
I would use cell phone banking if I could use it on a trial basis first to see what it can offer.	.87	3.55 (1.01)	
I would use cell phone banking if I could test it first.	.78	3.74 (.97)	
I would use cell phone banking if I could see a trial demo first.	.69	3.48 (1.00)	
<b>Factor 4: Amount of Information Received</b>			6.35
I have generally received enough information about cell phone banking.	.78	3.06 (1.27)	
I received enough information about the benefits of cell phone banking.	.77	3.09 (1.19)	
I obtained information on cell phone banking via the bank and its management.	.69	3.60 (1.23)	
<b>Factor 5: Perceived Risk</b>			5.71
Information concerning my cell phone banking can be tampered with by others.	.76	2.88 (1.06)	
I am concerned about the security aspects of cell phone banking.	.68	3.58 (.68)	
Cell phone banking is a risky mode of banking.	.60	2.58 (1.12)	

**Table 2: Perceptions of Cell Phone Banking Adoption**

Determinants of Cell Phone Adoption	Means (Standard Deviation)			t (sig)
	Total sample (n = 200)	Non Users (n = 61)	Users (n = 122)	
Perceived Usefulness	3.68 (.80)	3.41 (.72)	3.84 (.81)	-4.02 (.001)
Perceived Ease of Use	2.32 (.75)	2.69 (.71)	2.08 (.68)	5.99 (.001)
Trialability	3.59 (.78)	3.72 (.73)	3.50 (.81)	1.98 (.05)
Amount of Information Needed	3.26 (.98)	2.80 (.96)	3.53 (.88)	-5.56 (.001)
Perceived Risk	3.03 (.82)	3.41 (.59)	2.79 (.85)	5.58 (.001)

**Table 3: Determinants of Adoption of Cell Phone Banking**

Dependent, Adoption	Coefficients				Outcome
	Un-standardized		Standardized		
Hypotheses	Beta	Std. Error	Beta	t (p)	
H1: Perceived Usefulness	.67	.16	.30	4.34 (.001)	Supported
H2: Perceived Ease of Use	-.93	.16	-.38	-5.85 (.001)	Supported
H5: Trialability	-.35	.17	-.15	-2.14 (.03)	Not Supported
H6: Amount of Information	.74	.12	.40	6.05 (.001)	Supported
H7: Perceived Risk	-.87	.15	-.39	-5.91 (.001)	Supported

## DISCUSSION

Overall findings demonstrate that the adoption of cell phone banking is positively and significantly influenced by perceived usefulness, ease of use and amount of information received, while perceived risk has a significant and negative effect on cell phone banking adoption. This means that consumers are more likely to use cell phone banking when it is perceived to be useful, less complex and less risky, and that there is an array of information that has been communicated about cell phone banking. Generally the results in this study do correspond to related previous studies (i.e., Amin, 2008; Brown et al., 2003) that have shown that perceived usefulness, ease of use, perceived risk and amount of information are important factors in the adoption of various innovations. Contrary to expectations, trialability has a negative and significant effect on cell phone adoption which means that consumers do not feel that it is necessary to try cell phone banking first before adoption. Similarly, relative advantage and compatibility did not emerge in the current study. In fact, one indicator of relative advantage loaded on perceived usefulness which means that the two factors could be perceived as closely linked in the minds of respondents. Furthermore, all the measures of compatibility were deleted based on the set criteria possibly it means that respondents did not perceive cell phone banking as compatible with their needs, values and lifestyles.

The current study enhances the body of research on the factors that influence adoption

of new banking technologies. It is hoped that the findings of this study will inspire bank managers and service providers who focus on designing marketing campaigns to promote the use of cell phone banking by focusing on the areas that are considered important in the adoption of cell phone banking. Specifically, banks could provide more information about cell phone banking especially to the users while trialability could be emphasized to the non users. In addition, users seem to perceive cell phone banking as secure and safe, useful and easy to use than non users which means that information targeted to non users could also emphasize the perceived usefulness, ease of use and security issues of cell phone banking. Considering that users still require more information, it is important that they will be informed regularly about new features, advantages and benefits of cell phone banking.

However, the factors identified as possible influences of cell phone banking adoption are not exhaustive and there are many other factors that could be examined that include demographic characteristics, price, cell phone experience, self-efficacy and perceived credibility among others. Studies could also examine differences in adoption processes between internet and cell phone banking. The sample used for the current study represented the young and educated and thus the opinions of many outside this profile were not covered. Thus, future studies need to target banking customers who are in paid employment or the business clients, which will offer a more comprehensive view of adoption of cell phone banking.

## REFERENCES

- Amin, H. (2008). "Factors Affecting the Intentions of Customers in Malaysia to Use Mobile Phone Credit Cards," *Management Research News*, 31(7), 493-503.
- Baxter, B. (2006). "Botswana: Portrait of Africa's Best Economy," *African Business*, No 324 (October).
- Brown, I. Cajee, Z. Davies, D. and Stroebel, S. (2003). "Cell Phone Banking: Predictors of Adoption in South Africa- An Exploratory Study," *International Journal of Information Management*, 23, 381-394.
- Calder, B. J., Phillips, L.W., and Tybout, A. M. (1982). "The Concept of External Validity," *Journal of Consumer Research*, 9(3), 240-244.
- Davis, F. D., (1989). "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology," *MIS Quarterly*, 319-340.
- Hsu, C, Lu, H. and Hsu, H (2007). "Adoption of the Mobile Internet: An Empirical Study of Multimedia Message Service (MMS)," *The International Journal of Management Science*, 715-726.
- Laforet, S. and Li, X. (2005). "Consumers Attitudes Towards Online and Mobile Banking in China," *International Journal of Bank Marketing*, 23(5), 362-380.
- Laurin, P. and Lin, H-H. (2005). "Towards an Understanding of the Behavioral Intention to Use Mobile banking," *Computers in Human Behavior*, 21 (6), 873-891.
- Laukkanen, T. (2007). "Internet Vs Mobile Banking: Comparing Customer Value Perception," *Business Process Management Journal*, 13(6), 788-797.
- Lee, M. S., Doherty, J., Keeling, K. A., and McGoldrick, P. J. (2003). "Using ZMET to Explore Barriers to the Adoption of 3G Mobile Banking Services," *International Journal of Retail and Distribution Management*, 31(6), 340-348.
- Lee, D., Park, J., and Ahn, J (2000). "On the Explanation of Factors Affecting E-Commerce Adoption". Working paper.
- Mosinyi, W. (2009). Botswana: Older Banks to follow FNB's lead in Mobile Banking. <http://mobilemoneyafrica.com>. Accessed 6 December 2010.
- Ontebetse K (2011). BTA Orders Mobile Operators to Disconnect Simcards, *The Botswana Gazette*, March,



<http://www.gazettebw.com/index>. accessed 03 May 2011.

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H. and Pahnla, S. (2004). "Consumer Acceptance of Online Banking: An Extension of the Technology Acceptance Model," *Internet Research*, 14 (3), 224-235.

Polatoglu, V.N. and Ekin, S. (2001). "An Empirical Investigation of the Turkish Consumers Acceptance of Internet Banking Services," *International Journal of Banking Marketing*, 19 (4), 156-165.

Sathye, M. (1999). "Adoption of Internet Banking by Australian Consumers: An Empirical Investigation," *International Journal of Bank Marketing*, 17 (7), 324-334.

Schiffman, L. G., and Kanuk, L. L. (2010). *Consumer Behaviour*, (10<sup>th</sup> ed., New Jersey: Prentice Hall.

Tan, M., and Teo, T. (2000). "Factors influencing the adoption of Internet banking," *Journal of the Association for Information Systems*, 1(5), 1-42.

Wang, Y-S. Wang Y-M, Lin, H., and Tang T. (2003). "Determinants of User Acceptance of Internet Banking: An Empirical Study," *International Journal of Service Industry Management*, 14 (5), 501-519.