

**INFLUENCE OF PERCEIVED EASE OF USE AND PERCEIVED  
RELATIVE ADVANTAGE ON GENERATION Y STUDENTS'  
ATTITUDES TOWARDS AND USAGE BEHAVIOUR OF MOBILE  
BANKING IN SOUTH AFRICA**

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**—Abstract—**

Mobile banking offers several advantages to both retail banks and their customers. However, in emerging economies such as South Africa, low mobile banking penetration remains a managerial dilemma that requires urgent attention. As a generational cohort, Generation Y is an important current and future customer segment for retail banks and their digital banking channels. The cost implications of servicing individuals in this cohort are largely dependent on their acceptance of these digital channels, including the mobile banking channel. As such, this article reports on a study undertaken to propose and empirically test a technology acceptance model (TAM) that considers the influence of perceived ease of use and perceived relative advantage on Generation Y university students' attitudes towards and usage of mobile banking in South Africa. A self-administered questionnaire was used to survey a non-probability convenience sample of 334 students registered at three public South African university campuses. Descriptive statistics, reliability measures, correlation analysis and structural equation modelling were used to analyse the collected data. The findings infer that South African Generation Y students' perceived ease of use and perceived relative advantage of mobile banking have a significant positive influence on their attitudes towards mobile banking, which, in turn, has a significant positive influence on their mobile banking usage behaviour. Understanding the factors that positively influence the Generation Y cohort's attitudes towards and usage behaviour of mobile banking will help retail banks in their efforts to influence

mobile banking consumer behaviour and promote greater acceptance of their mobile channels amongst this important market segment.

**Key Words:** Generation Y university students; ease of use; relative advantage; mobile banking attitude; mobile banking behaviour; South Africa

**JEL Classification:** G20, M31, O30.

## 1. INTRODUCTION

A number of mobile service delivery platforms have been introduced to the market as a result of rapid advancements in and adoption of mobile technologies (Sharp & Bevan-Dye, 2014). Among the leading sectors to adopt and use the Internet and mobile technologies in customer markets is the banking sector with the introduction of mobile banking (Laukkanen, 2007). Mobile banking is a digital banking channel that mainly involves performing financial transactions remotely using an application downloaded onto a mobile device such as an iPad or tablet, or mobile phone (Nel et al., 2012).

Although conventional branch banking remains important in servicing customers, it is associated with high employee and services costs (Kanchan et al., 2012). As such, retail banks are increasingly moving towards digital banking channels, including mobile banking to achieve their cost reduction and profitability targets (MacDonald & Koch, 2006). Mobile banking also offers customers more control over their financial transactions as well as convenience, given that it is inherently time and place independent (Laukkanen, 2007). Notwithstanding the potential benefits the mobile banking channel has to offer, worldwide and in South Africa, mobile banking penetration is lower than expected (Nel & Raleting, 2012).

In 2015, global mobile banking penetration was recorded at 42 percent. The United States of America recorded a mobile banking penetration of 35 percent, whereas across Europe and in the United Kingdom, a mobile banking penetration of 38 percent was recorded. The highest mobile banking penetration was recorded for China at 62 percent (KPMG, 2015). As for South Africa, a mobile banking penetration of 31 percent was recorded (FinScope South Africa, 2015). To address this managerial dilemma and exploit the conversion rate of customers to mobile banking adoption, role players in the retail banking sector, including marketing professionals, strategic, business and financial analysts, are advised to consider the factors that influences customers' attitudes towards and usage behaviour of mobile banking in general and specifically those of the potentially lucrative youth market.

Globally and in South Africa, the youth represent a lucrative current and future target market for several sectors, including retail banking. Generational studies refer to the current youth as Generation Y; a generation that comprises individuals born between 1986 and 2005 (Markert, 2004). In 2016, South Africa's population was estimated at 55 908 900 individuals, of which 38 percent were classified as being part of the Generation Y cohort (Statistics South Africa, 2016). Generation Y members are characterised as being early technology adopters, digitally sophisticated and hyper-connected to one another (Deloitte, 2010), typically because they grew up in a digital era (Schlitzkus et al., 2010). The Generation Y market segment consists of many first time bank customers who expect to be serviced through innovative digital banking channels that maximise their banking convenience (KPMG South Africa, 2014). They are leading the way in the adoption of all things mobile, including mobile banking. This, coupled with the size of Generation Y in South Africa, suggests that they are an attractive customer market for mobile banking services (Deloitte, 2010). University students are an especially relevant marketing segment given that a graduate education often results in not only a higher earning potential but also a higher social status, which, in combination translates into university students being opinion leaders and trend setters amongst their peers (Bevan-Dye & Akpojivi, 2016).

In South Africa, there is a dearth of published studies on mobile banking. Even more worryingly, the mobile banking behaviour of the country's significantly sized Generation Y cohort's appears to have been largely ignored. In light of this gap in the literature, the purpose of this study was to propose and empirically test a model of the influence of ease of use and relative advantage of mobile banking on this generation's attitudes towards and usage behaviour of mobile banking in the South African context. This model is based on the technology acceptance model (TAM) proposed by Davis (1989), which is famous for being parsimonious and robust in predicting customers' acceptance of technology.

## **2. LITERATURE REVIEW**

### **2.1. Technology acceptance model (TAM)**

The TAM, originally developed by Davis in 1986 and formally published in 1989 (Davis, 1989), is a less general model of new technology acceptance (Gu et al., 2009). The TAM predicts the influence of ease of use and usefulness on individuals' attitudes and behavioural intention towards adopting new technology. The TAM consistently explains a substantial amount of variance in behavioural intentions and usage behaviour of new technology (Davis, 1989). The TAM is popular in technology adoption research as it allows for quick and low cost data

collection (Gu et al., 2009), and demonstrates acceptable validity and reliability (Sharp, 2007). As such, several studies (Taylor & Todd, 1995b; Polančič et al., 2010; Lee et al., 2011) have used the TAM to understand customers' attitudes towards and usage behaviour of new technology.

## **2.2. Ease of use of mobile banking**

A system or innovation is perceived easy to use when its operations necessitate minimal physical effort and intellectual ability (Davis, 1989). A technological innovation that is uncomplicated and requires little operational efforts generates better performance (Ndubisi, 2006), which leads to greater customer adoption (Maduku & Mpinganjira, 2012). Technology that is easy to use is likely to encourage customer usage by developing a favourable attitude towards the innovation (Nor & Pearson, 2008). As such, the ease of use of mobile banking is viewed as an important antecedent of attitudes towards mobile banking. Indeed, a number of international studies (Lee, 2009; Wessels & Drennan, 2010; Akturan & Tezcan, 2012) confirm the influence of ease of use on attitudes towards mobile banking. Consistent with these studies, this study postulates that the ease of use of mobile banking positively influences attitudes towards mobile banking.

## **2.3. Relative advantage of mobile banking**

A system or innovation offers a relative advantage when its benefits are superior to that of its predecessor and when it can provide greater efficiency (Nor & Pearson, 2008) and performance enhancement (Kim et al., 2009). Compared to branch banking, mobile banking is accessible 24/7 from any location (Laukkanen, 2007). As such, mobile banking offers a relative advantage in terms of convenience, as well as time and cost savings, flexibility and mobility (Looney et al., 2004). Hypothetically, it is anticipated that customers who perceive any technological innovation as offering several advantages, would develop a positive attitude towards it (Nor & Pearson, 2008). Several mobile banking studies (Wessels & Drennan, 2010; Akturan & Tezcan, 2012; Khasawneh, 2015) validate the influence of relative advantage on attitudes towards mobile banking. In line with these studies, this study theorises that the relative advantage of mobile banking positively influences attitudes towards mobile banking.

## **2.4. Attitudes towards and usage behaviour of mobile banking**

An individual's attitude is his or her favourable or unfavourable judgement, opinion and propensity towards an idea or object (Kotler & Armstrong, 2012). Attitudes develop as one progresses through and learns in life (Himansu, 2009), and may result in specific consumer behaviour. While attitudes are enduring

(Schiffman et al., 2010), external factors may influence and change individuals' attitudes (Hanna & Wozniak, 2001). An individual's attitude towards the adoption of a technological innovation is derived from his or her perception that the use of the innovation will lead to certain outcomes (Ajzen, 1991). When individuals display a positive attitude towards a certain type of behaviour, their intention to engage in that behaviour is likely to be greater (Thornton et al., 2007). Understanding the factors that predict customers' attitudes towards a technological innovation is important, given that attitudes have a direct, positive and robust influence on customers' behaviour (Sommer, 2011). The literature suggests that attitude is an antecedent of actual behaviour (Alsajjan & Dennis, 2009). Consistent with the literature, some international studies on mobile banking (Lin, 2011; Mazhar et al., 2014) indicate that attitudes positively influence actual usage behaviour. Therefore, this study proposes that attitudes towards mobile banking positively influence mobile banking usage behaviour.

### **3. METHODOLOGY**

#### **3.1. Sample**

The target population for this study was defined as male and female students between the ages of 18 and 24 years, registered at South African public higher education institutions (HEIs). The sampling frame included the 26 registered South African public HEIs. From this sampling frame, a judgment sample of three HEI campuses based in the Gauteng province was selected. Subsequently, a non-probability convenience sample of 150 students per campus was taken, which equates to a sample size of 450 students. Similar published studies also used sample sizes within this range, such as Sangle and Awasthi (2011) (sample size of 400) and Lee (2009) (sample size of 446).

#### **3.2. Instrument and data collection**

A self-administered questionnaire was employed to collect the required data. The Internet banking adoption scale (Nor & Pearson, 2008) was adapted to measure Generation Y students' perceived ease of use of mobile banking (three items), perceived relative advantage of mobile banking (three items), attitudes towards mobile banking (three items) and their mobile banking usage behaviour (three items). All the scaled responses were measured on a six-point Likert scale that ranged from strongly disagree (1) to strongly agree (6). The questionnaire included a section to gather the participants' demographical information and a cover letter, which explained the purpose of the study and promised the

participants that their responses would be treated as confidential, only to be outlined in the form of statistical data.

The questionnaire was subjected to a pilot test on a convenience sample of 59 students enrolled at a private South African HEI campus. The Cronbach alpha values calculated for the individual constructs in the pilot results ranged between 0.6 and 0.8, which is within the suggested cut-off level of 0.6 (Malhotra, 2010). This is indicative of internal-consistency reliability (Pallant, 2010). The questionnaire was then administered to the main sample.

Telephone contact was made with the lecturers at each of the three campuses who were asked whether they would allow questionnaire distribution to their students. The questionnaire, accompanied by the ethics clearance certificate, was shown to those lecturers who agreed to provide access to their students. Subsequently, fieldworkers handed out the questionnaires to the students at each of the three campuses. Student participation was voluntary and the questionnaire's cover letter guaranteed the confidentiality of the participants' information.

#### 4. RESULTS

Of the 450 distributed questionnaires, 116 questionnaires were either incomplete or did not meet the target population specifications. This left 334 complete and usable ones for statistical analysis, which translates into a response rate of 74 percent. Each of the seven age groups specified in the target population were included in the sample. The sample comprised more female (58%) than male (42%) participants. The majority of the sampled participants were made up of the African (84%) ethnic group, followed by the White (11%) ethnic group. There were more third year (38%) participants in the sample, followed by first (27%) and second year participants (26%). The sample comprised participants from each of South Africa's nine provinces. Table 1 reports on the sample description.

**Table 1.** Sample description

Age	%	Gender	%	Ethnicity	%	Year of study	%	Home province	%
18	7	Male	42	African	84	First year	27	Eastern Cape	2
19	14	Female	58	Coloured	2	Second year	26	Free State	11
20	26			Indian/Asian	3	Third year	38	Gauteng	57
21	25			White	11	Fourth year	3	KwaZulu-Natal	3
22	14					Post-graduate	6	Limpopo	11
23	9							Mpumalanga	6
24	5							Northern Cape	1
								North-West	7
								Western Cape	2

The descriptive statistics and Cronbach's alpha values were calculated for each of the constructs, followed by the construction of a correlation matrix of Pearson's product-moment correlation coefficients. These results are reported on in Table 2.

**Table 2.** Descriptive statistics, reliability measures, and correlation coefficients

Constructs	Means	Standard deviations	Cronbach's alphas	F1	F2	F3
Perceived ease of use (F1)	4.71	1.01	0.86			
Perceived relative advantage (F2)	4.99	0.93	0.93	0.332*		
Attitudes towards mobile banking (F3)	4.93	0.91	0.83	0.328*	0.486*	
Mobile banking usage behaviour (F4)	3.88	1.46	0.76	0.377*	0.434*	0.473*

\* Statistically significant at  $p \leq 0.01$  (2-tailed)

As indicated in Table 2, Cronbach's alpha values exceeding the recommended level of 0.60 (Malhotra, 2010) were calculated for each of the four constructs, thereby providing evidence of internal-consistency reliability of the scales in the main survey. Means above 3.5 were recorded on each of the constructs, which, given the six-point Likert scale used, suggests that South African Generation Y students perceive mobile banking as easy to use and as having relative advantages. Furthermore, they have a positive attitude towards mobile banking and report engaging in mobile banking usage.

In terms of the relationships between the constructs, there were statistically significant positive correlations ( $p \leq 0.01$ ) between each of the pairs of constructs, which implies that the measurement theory is nomological valid. In addition, there were no multicollinearity concerns as the collinearity diagnostics revealed tolerance values above the cut-off level of 0.10, ranging from 0.568 to 0.716 and an average variance inflation factor (VIF) of 1.64, which is below the cut-off of 10 (Pallant, 2010). Given the nomological validity of the measurement theory, as well as a lack of any evidence of multicollinearity issues, it was possible to conduct structural equation modelling.

A four-factor measurement model was specified for confirmatory factor analysis that comprises perceived ease of use (three indicators), perceived relative advantage (three indicators), attitudes towards mobile banking (three indicators) and mobile banking usage behaviour (three observed variables). For model identification purposes, the first loading on each of the four factors was fixed at 1.0. Therefore, there were 78 distinct sample moments, and 30 parameters to be

estimated, leaving 48 degrees of freedom (df) based on an over-identified model, and a chi-square value of 86.45 with a probability level equal to 0.001.

The model was scrutinised for any problematic estimates, such as standardised factor loadings above 1.0 or below -1.0 and negative error variances (Heywood cases) (Hair et al., 2010), and composite reliability (CR), average variance extracted (AVE) and the square-root of the AVE ( $\sqrt{\text{AVE}}$ ) were calculated to assess the composite reliability and construct validity, as presented in Table 3.

**Table 3.** Measurement model estimates

Constructs	Standardised loading estimates	Error variance estimates	CR	AVE	$\sqrt{\text{AVE}}$
Perceived ease of use (F1)	0.82	0.67	0.86	0.67	0.82
	0.81	0.66			
	0.82	0.67			
Perceived relative advantage (F2)	0.90	0.82	0.93	0.81	0.90
	0.92	0.84			
	0.87	0.76			
Attitudes towards mobile banking (F3)	0.80	0.64	0.83	0.62	0.79
	0.81	0.65			
	0.75	0.56			
Mobile banking usage behaviour (F4)	0.69	0.48	0.77	0.53	0.73
	0.85	0.72			
	0.62	0.38			
Correlations	F1 $\leftrightarrow$ F3: 0.38	F1 $\leftrightarrow$ F4: 0.45	F2 $\leftrightarrow$ F1: 0.37		
	F2 $\leftrightarrow$ F3: 0.55	F2 $\leftrightarrow$ F4: 0.49	F3 $\leftrightarrow$ F4: 0.55		

The results in Table 3 show that there were no problematic estimates and that the relationship between each of the indicators and their constructs are statistically significant ( $p \leq 0.001$ ). CR values above 0.70 suggest composite reliability. Moreover, standardised loading estimates and AVE values above 0.50 indicate convergent validity. There is also evidence of discriminant validity, with the square-root of the AVE values exceeding their respective correlation coefficients (Hair et al., 2010). Model fit was assessed using the chi-square, the standardised root mean residual (SRMR), the root mean square of approximation (RMSEA), the goodness of fit index (GFI), the incremental fit index (IFI), the comparative fit index (CFI), and the Tucker-Lewis index (TLI). A non-significant chi-square value, together with GFI, IFI, CFI and TLI values larger than 0.9 (preferably above 0.95), and small SRMR and the RMSEA values of 0.08 or less indicate good fit (Malhotra, 2010). Despite a significant chi-square statistic [(86.45 (df=48,  $p < 0.000$ )]], the measurement model returned acceptable fit indices of SRMR=0.05, RMSEA=0.05, GFI=0.96, IFI=0.98, TLI=0.98 and CFI=0.98.



Based on this measurement model, a structural model was subsequently tested. The estimated standardised regression coefficients are presented in Table 4.

**Table 4.** Standardised regression coefficients for the structural paths

Paths	$\beta$	Unstandardised $\beta$	SE	p	Result	
Perceived ease of use $\rightarrow$ mobile banking	Attitudes towards mobile banking	0.23	0.21	0.055	0.001	Sig.
Perceived relative advantage $\rightarrow$ towards mobile banking	Attitudes towards mobile banking	0.49	0.47	0.059	0.001	Sig.
Attitudes towards mobile banking $\rightarrow$ banking usage behaviour	Mobile banking usage behaviour	0.60	0.91	0.116	0.001	Sig.

$\beta$ : beta coefficient; SE: standard error; p: two-tailed statistical significance

While the structural model again returned a problematic chi-square statistic [(113.77 (df=50,  $p < 0.000$ ))], the model produced acceptable fit indices of SRMR=0.07, RMSEA=0.06, GFI=0.94, IFI=0.97, TLI=0.96 and CFI=0.97. As indicated in Table 4, all paths tested were statistically significant ( $p \leq 0.01$ ). Attitudes towards mobile banking has a statistically significant positive influence on mobile banking usage behaviour ( $\beta = 0.60$ ,  $p < 0.001$ ). Perceived ease of use indirectly influences mobile banking usage behaviour via its statistically significant positive influence on attitudes towards mobile banking ( $\beta = 0.23$ ,  $p < 0.001$ ). Similarly, perceived relative advantage indirectly influences mobile banking usage behaviour via its statistically significant positive influence on attitudes towards mobile banking ( $\beta = 0.49$ ,  $p < 0.001$ ). The squared multiple correlation coefficients (SMCs) indicate that the model explains 39 percent of the variance in attitudes towards mobile banking and 36 percent of the variance in mobile banking usage behaviour.

## 5. DISCUSSION

Based on the TAM, this study sought to determine the influence of perceived ease of use and relative advantage of mobile banking on South African Generation Y students' attitudes towards and usage behaviour of mobile banking. Confirmatory factor analysis established that the proposed model is a four-factor structure, including perceived ease of use, perceived relative advantage, attitudes towards mobile banking and mobile banking usage behaviour. The measurement model demonstrated composite reliability, construct validity, and acceptable fit to the model, thereby making it appropriate for path analysis.

The structural model indicates that perceived ease of use and relative advantage of mobile banking indirectly influence Generation Y students' mobile banking usage behaviour via their influence on attitudes towards mobile banking. As such,

Generation Y students who perceive mobile banking as easy to use and as providing relative advantages, tend to display a more positive attitude towards mobile banking. This, in turn, leads them to engage in mobile banking usage, which is consistent with the TAM theory (Davis, 1989).

Attitude is a salient predictor of usage behaviour in TAM, and retail banks are advised to continuously monitor Generation Y members' attitudes towards mobile banking and seek ways to improve its ease of use and relative advantage over conventional banking services. To this end, retail banks may benefit from simplifying the mobile banking system through introducing live chat platforms in addition to secure messaging. Retail banks are advised to offer a distinct benefit and value through their mobile banking channel, such as introducing a digital safe box. Retail banks can also link their mobile banking system to the home automation system to enable the payment of automatic grocery restocking. Retail banks are encouraged to monitor mobile banking usage on a regular basis, by benchmarking the operations of their mobile banking system against the best performing competitors in their key markets. As retail banks look to the future, Generation Y is an important customer segment to engage. It is therefore important that retail banks understand the factors that drive this cohort's banking preferences and demands.

## **6. LIMITATIONS AND FUTURE RESEARCH**

In terms of limitations, this study used the non-probability convenience sampling. Although several demographic questions were included to determine the degree to which the sample was representative of the target population, care should be taken when interpreting the results and in generalising the results to the wider Generation Y cohort in South Africa, particularly given that the study was limited to one South African province. In addition, this study undertook a single cross-sectional research design, which offers only a snapshot in time. Future research, using a longitudinal research design is recommended.

## **7. CONCLUSION**

The success of mobile banking depends largely on consumers' acceptance thereof, and presently, the youth are leading the way forward towards new technology adoption. The model empirically tested in this study concluded that Generation Y students' perceived ease of use and relative advantage of mobile banking have a positive influence on their attitudes towards mobile banking, which, in turn, has a positive influence on their mobile banking usage behaviour. Marketing professionals, strategists, policy makers, financial and business analysts, within

the retail banking sector, can use the findings of this study to better understand Generation Y customers' mobile banking behaviour and formulate effective strategies to promote increased customer acceptance of mobile banking.

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