World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:9, No:11, 2015

An Empirical Investigation of Mobile Banking Services Adoption in Pakistan

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Open Science Index, Economics and Management Engineering Vol:9, No:11, 2015 publications.waset.org/10002805/pdf

***Abstract*—**Adoption of Information Systems (IS) is receiving increasing attention such that its implications have been closely monitored and studied by the IS management community, industry and professional gatekeepers. Building on previous research regarding the adoption of technology, this paper develops and validates an integrated model of the adoption of mobile banking. The model originates from the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB). This paper intends to offer a preliminary scrutiny of the antecedents of the adoption of mobile banking services in the context of a developing country. Data was collected from Pakistan. The findings showed that an integrated TAM and TPB model greatly explains the adoption intention of mobile banking; and perceived behavioural control and its antecedents play a significant role in predicting adoption Theoretical and managerial implications of findings are presented and discussed.

***Keywords*—**Developing country, mobile banking service adoption, technology acceptance model, theory of planned behaviour.

I. Introduction

INNOVATION and development in mobile information systems and mobile finance has been rapid. Like other digital banking channels such as automated teller machines, telephones and the internet, mobile devices offer immense convenience, ease of use, connectivity and an innovative option of anytime, anywhere, any device banking to various consumer segments such as the banked, underbanked and unbanked. Reference [23] considered a 'mobile device' as a handheld mobile unit supporting mobile telephony and mobile data communication. More specifically, this classification includes cell phones, feature phones, smartphones and tablet devices.

Prior research [54] has defined Mobile Banking (MB) as a product or service offered by a bank, a microfinance institute or a mobile network operator for conducting various financial (funds transfer) and non-financial (balance enquiry) transactions using a mobile device. Industry and research have identified 'm-banking' as a vital electronic banking channel [1]. The term 'm-banking' has interchangeably been used in the literature with 'smartphone banking' [42], 'WAP Banking' [49], 'SMS banking' [39], and so forth.

Focusing on the relationships between customers and banks over the mobile platform [61], extant marketing and IS literature have concluded that the use of portable devices in banking services is still in its infancy [54]; furthermore, MB's broad adoption still remains low even within established markets [36]. Thus, the current authors increasingly believe that these singularities in MB adoption are critically significant to the study and identification of antecedents that influence it, and therefore require examination.

The aim of this study is to first examine MB in the context of a developing country. To the best of our knowledge, this is the first study on MB adoption in Pakistan. Second this study analysed 'adoption intention' as the dependent variable and provided a comprehensive insight into the deciding factors affecting the adoption of MB. To guide this effort, the current research aimed to develop a holistic understanding of IS acceptance in a developing country by integrating the key latent variables of the Technology Acceptance Model (TAM) [perceived usefulness (PU) and perceived ease of use (PEOU)], and Theory of Planned Behavior (TPB) [subjective norm (SN) and perceived behavioural control (PBC)] with perceived risk (PR), attitude (ATT), self-efficacy (SE), regulatory support (RSUP), technology support (TSUP) and adoption intention (INT) as dependent variables.

The remaining sections of the study are organized as follows: Section II presents a brief overview of MB adoption and the state of MB in Pakistan. Subsequently, we present the theoretical background on the TAM and TPB and propose a research model and hypotheses (Section III). The remaining sections present the research design and methods and finally the results. A discussion on the study's limitations, contributions and recommendations for future research brings the manuscript to a close.

II. Literature Review and Theoretical Background

Before introducing the theoretical critique of these models (TAM and TPB), the authors summarize the state of MB and MB service adoption in Pakistan, where the empirical work was undertaken.

A. Mobile Banking

The conventional focus of digital banking is shifting from technology development to customer behaviour [67]. As a result, IS and marketing scholars have begun to understand its indispensability. In this regard, most of the executives and marketing managers have already realized the strategic significance of information technology investments as a competitive advantage to their organizations in developing and offering innovative digital banking services such as internet and MB.

Prior research on marketing and banking technology has treated the terms 'm-banking' and 'internet (or online) banking' as two separate digital banking channels after considering the difference of environment, technologies and

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device [24], [15] although some authors have used these two terms interchangeably [32]. A few have considered MB as internet banking using mobile devices [25] and some have considered MB as an extension or an evolutionary step to follow internet banking [9].

B. Mobile Banking Adoption

Reference [64] defined two streams of research regarding how and why consumers adopt and use new IS such as MB. One stream of research discusses consumer acceptance (or pre-adoption) of IS by using intention as a dependent variable. Another stream discusses the consumer continuous usage (or post-adoption) of IS using usage as a dependent variable. Each of these research streams has contributed significantly towards the development of literature on individual acceptance and usage of an IS.

C. Mobile Banking in Pakistan

MB in Pakistan is largely dominated by short message service (SMS) banking. According to the [57], [58] 24 banks were offering internet banking services and 13 were offering MB services to over 1.6 million registered MB customers. These reports further revealed that this 1.6 million person MB consumer base conducted nearly 1.7 million transactions amounting to around Rs.17.2 billion that constituted a volume share of only 1.6% and value share 0.2% of total electronic banking transactions conducted in Pakistan, thereby leaving a huge growth potential to be explored for MB adoption and usage in the country. What is more intriguing is that, according to [45], cell phone ownership in Pakistan grew at an astoundingly fast rate, with 53% of the adult population now owning a cell phone, up from just 5% in 2002. Considering this recent growth, 'phenomenal' is the word that best describes the emergence and adoption of mobile technology in Pakistan.

D. Technology Acceptance Model

Reference [10] and [3] developed the TAM and the TPB respectively. TAM has been used extensively in various domains (individual and organizational) across different regions of the world to address different aspects influencing technology adoption, while taking into account the fact that humans are the weakest link in information technology adoption [56].

The TAM consists of two important independent variables i.e. 'perceived usefulness-PU' and 'perceived ease of use-PEOU'. Many researchers [65] [31] suggest that in order to provide better explanations and predictions of an individual's adoption intention or behaviour, the TAM needed to be extended with additional antecedents such as self-efficacy, institutional support, anxiety and voluntariness [43]; perceived mobility [41]; perceived validity and perceived language independence [65] and so forth. A decade later in 2000, [63] suggested a theoretical extension of the TAM and consequently TAM2 was proposed with some additional constructs that explain PU and PEOU intentions in terms of social influence processes and cognitive instrumental processes.

E. Theory of Planned Behavior

Like the TAM, TPB was originally derived from the TRA as an extension and incorporation of an additional construct (perceived behaviour control; PBC), to consider a situation where an individual lacks control over the targeted behaviour [3]. The antecedents in TPB include ATT, subjective norms and PBC.

Over the past two decades, the TAM and TPB have been widely used in IS management and consumer and marketing research, and have been applied to examine IS acceptance and usage in the context of e-service [21], internet banking [38], on-line tax filing systems [29] and so forth. However, to our knowledge, the TAM and TPB have not been used to analyse the adoption of MB services. Furthermore, considering the complimentary nature of the TAM and TPB, extant literature has focused on integrating them to examine information technology usage and e-service acceptance; the results have shown that the integration model had better exploratory power than individual use of the TAM or TPB [6].

III. Research Model and Hypothesis

The model (see Fig. 1) proposes that PU, PEOU and PR have a direct effect on ATT, which is hypothesized to positively affect INT. Given the implicit uncertainty of the MB environment, the authors believe that PU and PEOU may not accurately reflect the motivation of consumers to adopt/accept MB under security threats. In this situation, PR is considered an influential antecedent. Moreover, PEOU is proposed to have a direct effect on PU, which in turn also directly affects INT. The model also proposes that SN has a direct effect on INT. Finally, SE, RSUP and TSUP have direct effects on PBC, which is hypothesized to positively affect INT. Limited research has analysed the evidence of the effect of RSUP and TSUP on PBC in the context of MB; however, we believe that understanding the impact of such variables is generally ignored by researchers, but it is crucial from a practice and regulator/government point of view.

Consequent to the development, adoption and usage of various IS over the last two decades, the scope of PU and PEOU has been extended and they have been tested as key independent variables and intention drivers in different settings.

PU is defined as 'the degree to which a person believes that using a particular system would enhance his/her job performance' [10], and PEOU is defined as 'the degree to which a person believes that using a particular system would be free of physical and mental effort' [10]. In addition to PU and PEOU, another important construct used in our model is PR. [5] introduced the concept of PR and defined risk in terms of uncertainty and consequences associated with consumer actions.

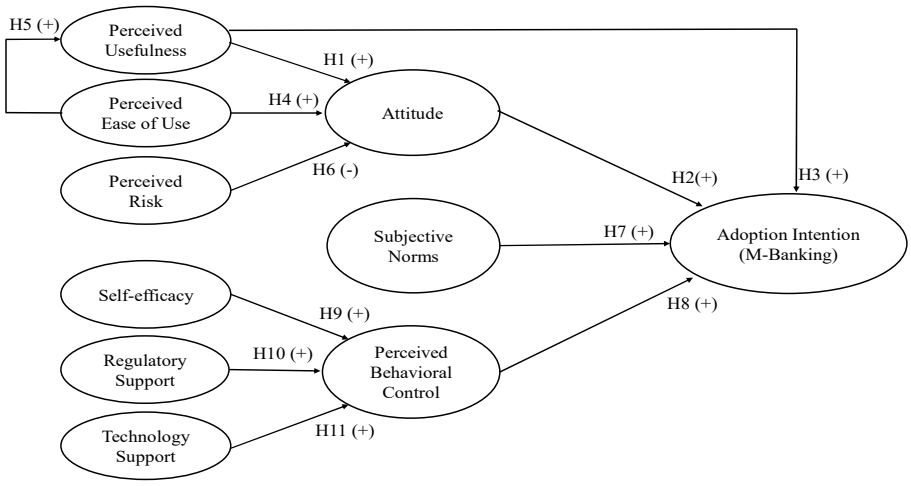


Fig. 1 Research Model

Previous research [44] has constantly argued that, in the case of technology acceptance, a positive relationship is found between PU and PEOU. Reference [26] concluded that intention to use e-services such as online banking is adversely affected by the security, privacy risk and financial risk and is positively affected by perceived benefit, ATT and PU. Reference [27] concluded that as compared to PU, perceived enjoyment is a more significant antecedent of ATT in the usage of social network sites. Reference [38] recorded more comprehensive findings in the context of internet banking and concluded that PU and PEOU are significantly and positively influencing ATT, which in turn significantly and positively influences INT. Prior research indicates that PR is an important determinant of both initial purchase intention and repeat purchase intention [8]. Here, [30] concluded that PR indirectly impacts intentions to use an online application under security threats. This implies that once the consumers have realized that MB services could produce negative consequences, they will avoid those negative consequences by refusing to accept or adopt MB services. In view of the above, we hypothesized that:

H1: PU of m-banking services has a positive effect on consumer ATT.

H2: Consumer ATT has a positive effect on m-banking service INT.

H3: PU has a positive effect on m-banking service INT

H4: PEOU of m-banking services has a positive effect on consumer ATT.

H5: PEOU has a positive effect on PU of m-banking services.

H6: PR of m-banking services has a negative effect on consumer ATT.

SN is one of the important constructs of the TPB that influences the behavioural intention of an individual. SN refers to the perceived social pressure about whether to adopt a specific behaviour [2]. Prior research on IS adoption studies [47] has noted that social influence or SN is an important predictor of intention to adopt IS. For example, [53] found a significant influence of SN on PU and INT. Lately, a new construct, namely technology awareness, emerged as a central and strong determinant of INT, SN and ATT [11]. Thus, it is hypothesized that:

H7: SN has a positive influence on m-banking services INT.

SE is defined as 'a belief in one's capability to organize and execute the courses of action required to produce given attainments' [19]. In other words consumers with a strong sense of SE consider difficult tasks as challenges to be mastered, rather than as personal threats to be avoided [33]. Some degree of similarity is also observed between SE and PBC; they are generally concerned with internal and external controls. Thus, PBC refers to the factors that may impede the performance of the behaviour [60].

Previous research on computer SE [66] confirmed the critical role it plays in understanding individual responses to IS. The concept of SE revolves around the notion that an individual with high IS expertise might have a higher intention to use that IS than an individual with lower expertise [66]. Consequently, the research has found that SE has a direct influence on IS usage such as web-based IS [37], banking IS [50] and so forth. As a result, research [32] suggests that SE of MB will be an important knowledge resource for users to adopt MB services. It is, therefore, hypothesized, that:

H8: PBC has a positive effect on m-banking services INT.

H9: SE has a positive effect on PBC.

Another important antecedent of PBC is TSUP used in this study to analyse consumer behavioural intention of adopting MB. Unlike previous research where the antecedent TSUP with regard to PBC was found to have no significant influence on intention to adopt internet banking services [60], the current study considered these antecedents significant in the context of MB. This was largely based on the assumption that the demographics of Pakistan revealed a large rural or remote population (i.e. more than 60%) [62] that require continuous support from MB service providers such as banks, mobile network operators and agents (or merchants) in embracing and using MB services.

RSUP is one of the important components of PBC and the

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authors have analysed its effect on consumer INT to adopt MB services. Previous research revealed that the success of IS such as mobile or internet banking is determined by banks or government (or more specifically the regulatory support) and also by its acceptance by customers [22]. It is therefore hypothesized that:

H10: RSUP has a positive effect on PBC.

H11: TSUP has a positive effect on PBC.

IV. Research Methodology

The research model included ten latent variables, each of which was measured with multiple items on a scale from one (strongly disagree) to seven (strongly agree). All the items were adapted from the literature to preserve content validity [59].

The data was collected using on-site data collection methodology during July-August, 2014. At the outset, the study participants recruited for this study and mainly including students and professionals were informed about the purpose and objective of the study. In all, 210 respondents participated in the study and completed the questionnaire. After careful scrutinization of collected questionnaires and removal of those with several missing values or similar answers to all questions, 189 valid responses were returned. To assess nonresponse bias, the responses of the first 25% of respondents were compared to the responses of the last 25%; no significant difference was found between the two groups ($p > 0.05$ level). This indicated that nonresponse bias was unlikely to have occurred.

V. Data Analysis, Major Results, and Discussion

The study sample was male dominated. Out of 189 participants, 61.4% were male and 38.6% were female. Cell phone users tended to belong to higher social grades and were youthful. Primarily, 82.5% were aged between 18 and 40 years. A few participants (6.4%) were over 50 years (see Table I).

A. Measurement Model

To evaluate the psychometric properties of the measures, an exploratory factor analysis was conducted. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.879 and Bartlett's test of Sphericity was significant at the 0.0001 level; this indicated that the dataset was appropriate for factor analysis. The hypotheses were subsequently tested through partial least squares (PLS) using the SmartPLS 3.0 [51]. The PLS algorithm provides loadings between reflective constructs and their indicators (outer loadings) and loadings between formative constructs and their indicators (outer weights). It also generates standardized regression coefficients between constructs to estimate their relationships. Coefficients of multiple determination (R2) for all endogenous constructs in the model are also provided by PLS software.

B. Convergent and Discriminant Validity

All constructs in this study were operationalized as reflective measures. Thus, we assessed the measurement model in terms of item reliability, internal consistency and discriminant validity. The rule of thumb for accepting items is to have loadings of 0.70 or greater, although loadings of at least 0.5 are considered acceptable [4]. Only one indicator (item PR3) had a loading of less than 0.7 as shown in Table II. Internal consistency was examined using [13] composite reliability index. The composite reliability values for all constructs exceeded the acceptable value of 0.7 [16], with SE having the lowest (0.846) and INT the maximum (0.950).

TABLE I
Demographic Characteristics of Respondents (N = 189)

Demographic Characteristic	Category	Frequency (N)	Percent
Gender	Male	116	61.4
	Female	73	38.6
Age	18-25	97	51.3
	26-30	40	21.2
	31-40	19	10.0
	41-50	21	11.1
	51-60	9	4.8
	≥ 61	3	1.6
Highest education level	College	40	21.2
	Bachelor	96	50.8
	Master	53	28.0
Current employment status	Student	116	61.4
	Employed	54	28.6
	Entreprenuer	17	9.0
	Unemployed	2	1.0
Since how long have you been using a cellphone?	< 1 year	5	2.6
	> 1 year	9	4.8
	> 2 years	21	11.1
	> 3 years	42	22.2
	> 4 years	34	18.0
	> 5 years	78	41.3

Discriminant validity indicates the extent to which a given construct is different from other latent constructs. An average variance extracted (AVE) value of 0.5 indicates an acceptable level [13]. The AVE by our measures ranged from 0.578 to 0.864; these were all above the acceptable value of 0.5. Further assessment of discriminant validity of the latent variables in the PLS path model was performed using [13] criterion. Each construct meets [13] criterion in support of discriminant validity. An examination of loadings and cross loadings provided further demonstration of convergent and discriminant validity where all constructs were more strongly correlated with their own measures than with any other constructs.

C. Common Method Variance (CMV)

CMV is 'variance that is attributable to the measurement method rather than to the constructs the measures represent' [7]. The common method bias procedure involves a series of steps. Here the path model is modified to consider each indicator or manifest variable as a 'factor' linked to its second order construct. A new factor (termed the method construct) is then added whose indicators include all the indicators used in the latent variables in the research model [28]. The results derived from the analysis indicate that the average factor

loading was 0.71 and that the average variance explained by the common method construct was 0.01, indicating that common method bias did not significantly affect our study results.

D. Structural Model

The structural model represents the relationships between constructs or latent variables that were hypothesized in the research model. Here [12] suggest that the variance explained or R2 for endogenous variables should be greater than 0.1. R2 values of 0.67, 0.33 or 0.19 for endogenous latent variables are described as substantial, moderate or week [18]. The variance explained for each dependent construct is shown in Fig. 2.

All four endogenous constructs (INT, ATT, PBC and PU) meet [12] rule of 0.1. Adoption intention, the main dependent construct that is sought to predict and explain has a value of 0.553 with the ATT construct having the lowest R2 value of 0.307. Thus in predicting INT, the predictors PU, ATT, SN and PBC explain 55.3% of its variance. The effect of ATT on INT, PBC effect on INT and PEOU effect on ATT was significant at 0.001. PEOU effect on PU, PU on INT and the influence of TSUP on PBC was significant at 0.001. However, the direct effect of PU on ATT and SE effect on PBC was significant at 0.05. The non-significant paths were the effect of PR on ATT, RSUP effect on PBC and SN effect on INT.

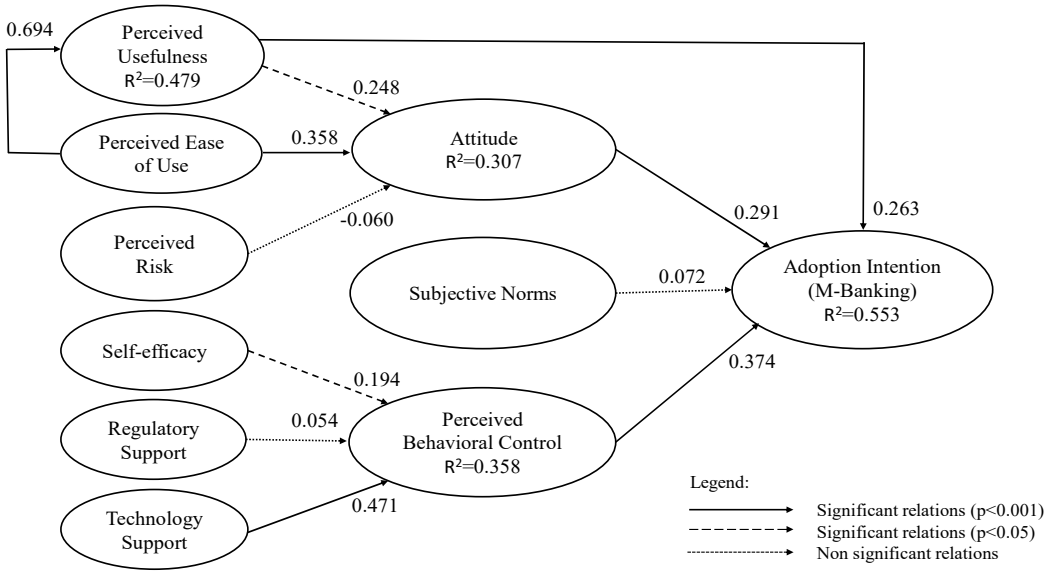


Fig. 2 Path Model Results

Further assessment of the path coefficients was performed by examining their f2 effect sizes. Effect size is a gauge of whether a predictor latent variable has a weak, medium or large effect at the structural level with values of 0.02, 0.15 and 0.35, respectively [18], [17]. The effect size of PEOU on PU is very large (0.93). The effect of TSUP on PBC and PBC effect on INT are medium. SN effect on INT is below 0.02 and hence considered very weak.

In conformance with the nonparametric PLS path modelling approach, we applied a nonparametric bootstrapping procedure to test the significance of the mediating effects [20]. Notwithstanding that, the [55] test is the commonly used method to assess mediating effects; furthermore, simulation studies revealed that bootstrapping offers a better alternative. This is because in PLS path modelling, distributional assumptions are not imposed in model estimation [46]. The results indicate partial mediation for the mediating relationships except the indirect relationship of perceived risk and attitude effect on INT.

VI. Conclusion, Implications, Limitations, and Future Research Directions

This study is one of very few using the PLS analytical approach to model the combined TPM and the TAM, especially in the context of a developing country; it therefore provides important implications for theory and practice.

This study successfully integrated the TAM and TPB within the context of mobile service as done by previous IS researchers [66], [35]. This study explained 55.3% of MB adoption intention with three TPB factors ATT, SN and PBC and their antecedents. This study also explained that TPB factors PBC and ATT and TAM factor PU had a significant effect on MB INT. However, PBC had the strongest effect on MB INT (effect size f2 = 0.26) compared to ATT (f2 = 0.12) and PBC (f2 = 0.11).

PBC and ATT towards the adoption of MB play a significant role in partially mediating the individual antecedent factors of the TAM. Thus the fact that indirect effects can be revealed in the absence of direct or total effect can restrict research progress [52]. This is equally relevant in IS research

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because this may cause researchers to miss theorized relationships that may be present in the data or limit the mechanisms that the data seeks to reveal from the empirical context.

This study found that TSUP had a significant effect on PBC (with effect size f2 = 0.26) more than SE (f2 = 0.05) and both antecedent factors of the TAM were mediated by PBC. The theoretical implication is that in as much as the integrated TAM and TPB is a better model, both models complement each other in providing 'rich' nomological structural model relationships to better explain behavioural intention. This study supports prior research, which found a significant effect of PEOU on PU and PU on behavioural INT [66]. However, while [66] reported an explained variance (R2) of PU by PEOU of 24%, the current study reported an R2 of 48%, which is consistent with [32].

Our theory and findings offer a few valuable practical implications for decision makers in several organizations including banks, other financial institutions and service providers offering or intending to offer MB services. For instance, this study provided valuable insight into the behaviour of an individuals' intent to use MB services in future and the factors affecting their decision. The relative magnitude of the path coefficients in our integrated empirical model (see Fig. 2) suggest that PBC or the consumer's estimate of how easy or difficult it will be to carry out the behaviour is a significant factor that directly enhances INT.

Consequently, organizations providing MB services in a developing country such as Pakistan could effectively increase their adoption rate by providing user-friendly mobile application and services, creating awareness among the masses, and disseminating the benefits (value proposition) of MB to potential customers intending to use these services. Given the current rate of literacy in the country and a lack of know-how about the adoption and usage of technology based products such as MB, creating consumer awareness and building consumer confidence would provide several benefits to the industry such as increasing the rate of adoption, a potential catalyst for generating operational efficiencies and providing a new revenue avenue.

The findings of this study support the feasibility of using the proposed model to assist in understanding the key factors considered by users when adopting MB services. TSUP has a significant effect on PBC, which mediates this effect onto INT of MB. The implication for practice means that technological characteristics play a significant role in the process of adoption of MB services. Specifically, internet technology such as wireless broadband and faster internet access are important requirement for the adoption of MB services.

The integration of the TAM and TPB in this study also provides other options for strategy formulation. ATT is one of the key factors of TPB that influence INT. Thus, the ATT of potential users and users of MB services can be changed for the better if the antecedent factors are identified. This study did not find support for the influence of PR on ATT towards MB adoption in the context of Pakistan. This presupposes that resources for marketing communication can be deployed into 'selling' the value proposition of the 'usefulness' and 'ease of use of the service' to potential MB users. Thus, the authors believe that instead of using a scarce marketing communication budget for allaying the fears of potential users and users of MB services concerning 'risk', the resources can be used in selling the value proposition of the service. These efforts will then translate into changing peoples' ATT towards the use of MB services. This does not mean that issues of security and risk are not important. Mobile devices and mobile transactions are associated with some peculiar security challenges [48] such as physical security, transaction and post-transaction issues that require special attention by IS providers.

The current study is not without any limitations and, therefore, the results of the study cannot be interpreted without taking into consideration the factors discussed below:

First, despite mobile banking having emerged as an important banking delivery channel, investigation of MB service acceptance is relatively new to researchers in the field of IS [66]. This paper investigated MB adoption from the perspective of 189 participants in Pakistan using a cross-sectional correlational survey design. The various hypotheses were tested at a single point in time. Thus, predicting the MB adoption intention based on this sample from a particular geographical location in Pakistan will vary from a population in a sparsely populated rural region with no access to IT/IS infrastructure. Therefore, the findings from this study cannot be generalized. Future research should consider the use of different geographical locations and extend the discussion to include other technologies and a range of new target groups.

Second, a longitudinal research design could be used to follow up on MB INT over a considerable period rather than at a single point in time. This approach is expected to throw more light on some of the dynamic mechanisms that take place within the research setting. This is important because perceptions change over time as individuals gain experience [34].

Finally, the use of TSUP as a construct in this study has provided some insight into the role of technological features in IT/IS system adoption. One recent study looked at technology characteristics on task technology fit and its subsequent effect on adoption [40] based on task technology fit (TTF) [14] and the unified theory of acceptance and usage of technology (UTAUT] models. Further study could examine the impact of TSUP on ATT and its subsequent effect on INT. This could provide options for expanding the TTF model and its integration with TPB in predicting MB usage intention.

This study, based on the integration of the TAM and TPB models, proposed and validated a theoretical model through the use of partial least square structural equation modelling. New structural paths in our proposed model have provided further insights, for example, the important role that TSUP plays in the adoption process while some established paths (e.g. the effect of PEOU on PU) are consistent with previous research [15], [32], [66]. The model provides a useful framework for managers to assess success factors that drive MB service INT. These validated success factors provide

'prescriptions' to help in the design of intervention schemes targeted at potential users and consumers of MB services who may be less inclined to accept and use such innovative systems.

APPENDIX

TABLE II
LOADINGS, COMPOSITE RELIABILITY, AND AVERAGE VARIANCE EXTRACTED

Construct and indicators	Indicators	M	SD	Loading
Perceived usefulness (PU)	I think that using m-banking would enable me to accomplish my tasks more quickly (PU1).	5.65	1.497	0.848***
CR = 0.922	I think that using m-banking would make it easier for me to carry out my tasks (PU2).	5.53	1.378	0.883***
AVE = 0.746	I think m-banking is useful (PU3).	5.83	1.277	0.887***
	Overall, I think using m-banking is advantageous (PU4).	5.76	1.238	0.836***
Perceived ease of use	Learning to operate m-banking would be easy for me (PEOU1).	5.48	1.339	0.839***
(PEOU)	I would find it easy to get m-banking to do what I want it to do (PEOU2).	5.35	1.235	0.848***
CR = 0.939	My interaction with m-banking would be clear and understandable (PEU3).	5.31	1.350	0.878***
AVE = 0.721	I would find m-banking to be flexible to interact with (PEOU4).	5.31	1.314	0.881***
	It would be easy for me to become skilled at using m-banking (PEOU5).	5.56	1.231	0.853***
	I would find m-banking easy to use (PEOU6).	5.45	1.306	0.793***
Perceived risk	The decision of whether to use m-banking service is risky (PR1).	4.47	1.668	0.952***
CR = 0.892	Using m-banking service puts my privacy at risk (PR2).	4.77	1.580	0.811***
AVE = 0.625	Compared with other banking channels such as internet, m-banking has more uncertainties (PR3).	4.40	1.646	0.609***
	In general, I believe using an m-banking service is risky (PR4).	4.58	1.692	0.883***
Attitude (ATT)	Using m-banking would be a good/bad idea (ATT1).	5.50	1.197	0.855***
CR = 0.901	Using m-banking would be a foolish/wise idea (ATT2).	5.12	1.631	0.747***
AVE = 0.696	I dislike/like the idea of using m-banking (ATT3).	5.49	1.465	0.856***
	Using m-banking would be unpleasant/pleasant (ATT4).	5.47	1.339	0.873***
Subjective norm (SN)	People who influence my behaviour think that I should use m-banking (SN1).	4.71	1.538	0.855***
CR = 0.918	People who are important to me think that I should use m-banking (SN2).	4.75	1.466	0.893***
AVE = 0.788	People whose opinions are valued by me would prefer that I use m-banking (SN3).	4.93	1.502	0.914***
Self-efficacy (SME)	*I could complete a job or task using m-banking:*			
CR = 0.846	If there was no one around to advise me on the process (SME1).	4.78	1.513	0.778***
AVE = 0.578	If I could call someone for help if I got stuck (SME2).	4.94	1.289	0.759***
	If I had a lot of time to complete the task/job for which the m-banking service was provided (SME3).	4.80	1.509	0.725***
	If I had just the built-in help facility for assistance (SME4).	5.11	1.380	0.778***
Regulatory support	The State Bank of Pakistan (SBP) endorses m-banking in Pakistan (RSUP1).	4.99	1.435	0.885***
(RSUP)	SBP is active in setting up the facilities/regulations to enable m-banking in Pakistan (RSUP2).	4.98	1.444	0.930***
CR = 0.936	SBP promotes the use of m-banking in Pakistan (RSUP3).	4.90	1.457	0.917***
AVE = 0.830				
Technical support (TSUP)	Advances in mobile security technology provide for safer m-banking (TSUP1).	5.30	1.413	0.788***
CR = 0.851	Faster Internet access speed is important for m-banking (TSUP2).	5.79	1.133	0.819***
AVE = 0.657	Internet technology, like PTCL EVO Wireless Broadband, makes m-banking more feasible (TSUP3).	5.80	1.166	0.833***
Perceived behavioural	I have control over using m-banking (PBC1).	4.89	1.537	0.786***
control (PBC)	I have the resources necessary to use m-banking (PBC2).	5.32	1.327	0.862***
CR = 0.890	I have the knowledge necessary to use m-banking (PBC3).	5.34	1.361	0.788***
AVE = 0.669	Given the resource, opportunity and knowledge it takes to use m-banking, it would be easy for me to use m-banking (PBC4).	5.57	1.234	0.834***
Adoption intention (INT)	I would use m-Banking for my banking needs (INT1).	5.61	1.239	0.931***
CR = 0.950	Using m-Banking for handling my banking transactions is something I would do (INT2).	5.61	1.132	0.933***
AVE = 0.864	I can see myself using m-Banking for handling my banking transactions (INT3).	5.72	1.250	0.925***

Note: CR = Composite Reliability; AVE = Average Variance Extracted; M = Mean; SD = Standard Deviation
****Significant at p <0.001 level (two-tailed test)*

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