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A Mobile Banking Adoption Model in the Jordanian Market: An Integration of TAM with Perceived Risks and Perceived Benefits

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Abstract

Although consumer perceptions of the risks of adopting e-banking have been studied by many researchers, the perceived risk variable has only been examined as a single construct, which fails to reveal the actual attributes of perceived risk and clarify why consumers refuse to use such banking services. In order to provide a more comprehensive clarification of the perceived risks of adopting m-banking in Jordan, a more in-depth study of the characteristics of the perceived risks was conducted. The current research is designed to integrate the five dimensions of the perceived risk with the TAM in order to present a more comprehensive model of m-banking acceptance and adoption in Jordan. As such, a conceptual model and 8 hypotheses are tested with a sample of 404 mobile phone users, and analysed quantitatively. The findings of the current study provided support for the research model and for most of the hypotheses regarding the relationship among the model's variables. In particular, the research model presented in this paper is unique in that it synergistically combines the TAM variables along with perceived benefits, the various

dimensions of perceived risks, attitude and behavioral intention in evaluating the decision to adopt m-Banking.

Keywords: Mobile banking; TAM; Perceived risks, Perceived benefits, adoption of m-banking

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INTRODUCTION

Mobile phones have become a tool for everyday use, which creates an opportunity for the evolution of banking services to reach the population through mobile banking (m-banking). The use of m-banking can make basic financial services more accessible to people, minimizing time and distance to the nearest retail bank branches [1]. This newly emerging tool for providing financial services via mobile devices has generated the foundation of m-banking, which can be applied through such technological means as downloadable applications, mobile browsers, text messaging, and preloaded applications [2].

Rapid growth of m-banking enabled people to settle their banking transactions easily while saving time as every step of the procedure was at their fingertips. M-banking has evolved into a prominent system because of such features related to mobile technologies such as ubiquity, convenience and interactivity [3]. Particularly, m-banking is considered as an emerging facet of electronic banking [4], a new retail self-service delivery channel for banks [5] and is a pivotal topic of growth strategies for both banks and mobile provider services industries [6], that enables banks to offer information and provides services to their customers more easily, quickly and conveniently with the use of mobile devices [7,8]. M-banking is defined as a form of banking transaction via a mobile phone or Personal Digital Assistant (PDA) devices [9]. Taking this point further, m-banking allows customers to check their account balances, transfer funds, reload on phone airtime, perform credit card transactions as well as receive information alerts on the latest transactions in their debit and credit accounts.

However, despite the fact that m-banking enables customers to conduct banking services at anyplace and at any time [7], the usage and adoption of m-banking has not spread as was expected [9-11], and is still in early stage in comparison to other services provided by the banking sector due to uncertainty and security concerns [6-8,12,13]. More specifically, m-banking related literature proposed perceived risk as a salient obstacle to consumer acceptance of e-banking as well as m-banking mainly due to high risk concerns [6,12]. Although consumer perceptions of the risks of adopting e-banking have been studied by many researchers [14-16], the perceived risk variable has only been examined as a single construct, which fails to reveal the actual attributes of perceived risk and

clarify why consumers refuse to use such banking services. In order to provide a more comprehensive clarification of the perceived risks of adopting m-banking in Jordan, a more in-depth study of the characteristics of the perceived risks was conducted. Perceived risk was divided into five categories: performance, financial, time, social and security/privacy risks, as theorized by Jacoby and Kaplan [17], in order to explain which risk facets are more imperative in this arena.

In order to provide a concrete theoretical foundation for investigating the adoption of m-banking services, the current research is derived based on thoughts regarding the nomological structure of the technology acceptance model (TAM) [18]. As TAM has been applied in numerous studies to investigate and clarify customers' perceptions of system use and the possibility of adopting an online system [19-21], it is considered as the most suitable model for understanding m-banking adoption.

The current research is designed to integrate the five dimensions of perceived risk mentioned above with the TAM in order to present a more comprehensive model of m-banking acceptance and adoption in Jordan. Furthermore, the current study extends the scope of the adoption choice to obviously comprise both negative (perceived risk) and positive factors (perceived benefits) concurrently. In particular, the study makes a strong contribution to the current m-banking literature by extending TAM to include perceived benefits and the five facets of perceived risk. That is, previous TAM studies in the context of m-banking [22-24] did not include the importance and influence of perceived benefits and perceived risk; as a consequence, they may have omitted crucial factors that influence consumer adoption of m-banking. As a result, the present study may be of great benefit to practitioners by providing them with an increased understanding of how users interact with innovative technology so that providers can assess and cultivate benefits and reduce risk perception toward the eventual adoption. The current study will offer instrumental insights to traditional brick and mortar and web based banks before they shift towards the new m-commerce model. Theoretically, this study can contribute to the existing literature relating to benefits, risk, and emerging IT m-banking acceptance.

The rest of this paper is presented as follows. In the next section, the significance of the current research is presented. Then, a review of the related research is conducted in order to identify the theoretical framework for this study. Then, we present the methodology employed to conduct the study. The following section describes the statistical analysis and results. Finally, we conclude with a discussion, the study's limitations, implications, and calls for future research.

Significance of the Study

While the use of branch based retail banking is still very popular, banks have

other ways of providing customers with financial management services and one of them is m-banking [25]. The use of m-banking can make basic financial services more accessible, minimizing time and distance to the nearest retail bank branches [1]. The outstanding growth of mobile sector worldwide has created a unique opportunity to provide social and financial services over the mobile network. With over four billion mobile phone subscriptions worldwide, mobile network has the ability to immediately offer m-banking to 61% of the world population [26].

According to the International Telecommunication Union (ITU) report, there is significant growth in the use of mobile phones, with over 90% of the population in Jordan using them [27]. However, with all the benefits of m-banking, the usage and adoption of m-banking is still low among banks customers in Jordan [25]. Though many of such people argue that internet and other technology based transaction is not safe, not practical and would lead to fraud, a lot of people think it safer, flexible in time and can be done anywhere and anytime [28]. Hence, it is necessary to investigate the factors that lead customers to adopting or rejecting m-banking services. Although prior studies on m-banking adoption have provided background information on the adoption behavior with regard to m-banking, studies that focus on the risk and benefits perceptions factors that influence consumers to adopt m-banking services are limited.

Thus, understanding such factors will play a critical role in reducing the challenges associated with the use of m-banking. For example, risk and privacy issues have been identified as major contributing factors for the slow uptake of m-banking [29]. However, Rammile and Nel [25] revealed that consumers do not consider m-banking to be prone to risk. Risk and privacy are related to trust in the banking industry – which is especially important when banks are trying to increase their customer base and improve their services by introducing technological innovations [29]. However, previous studies still have many limitations and have recommended further research in this field. Among these limitations is the restricted geographical spread of study areas, as most of the previous m-banking studies have been conducted in the United States, Canada, and other developed countries.

Research questions and objectives of the study

The study seeks to investigate the influencing factors of m-banking in Jordan. Thus, it addresses the following questions to be answered.

Question 1: What are the main factors influencing customers to accept and adopt using of m-banking services?

Question 2: How does the user in Jordan perceive risk with regards to m-banking?

Question 3: What is the perception of m-banking users in Jordan about the benefits of using m-banking services?

Hence the specific objectives of the study can be summarized as follows:

- i. To examine whether perceived usefulness and perceived ease of use have any role to play in adoption of m-banking in Jordan.
- ii. To examine whether perceived risk and benefit significantly influence customers' attitude and behavioral intention to adopt m-banking.
- iii. To assess the effect of five components of perceived risk (performance risk, security/privacy risk, time risk, social risk and financial risk) with regards to the customers' attitudes and adoption of m-banking in Jordan.
- iv. To explore the role of perceived benefits in customers' attitude towards and behavioral intention to adopting m-banking in Jordan.
- v. To understand which factors are more influential in impacting the decision to use m-banking.
- vi. To assess whether the TAM provide a solid theoretical basis for examining the adoption of m-banking.

LITERATURE REVIEW

To provide a comprehensive foundation for the current study, the literature related to e-commerce, M-commerce, Internet banking, m-banking, and consumer adoption of new technology were reviewed with a particular focus on identifying the variables affecting customers' attitude and intention to adopt m-banking.

M-BANKING DEFINITION

M-banking has received a considerable attention in academic research and thus several conceptualization of m-banking currently exists. As the conceptual agreement is essential requirement for comprehensive discussion regarding the phenomenon [30], literature on m-banking was referred for establishing commonly accepted definitions.

M-banking (m-banking) is defined as is an emerging facet of electronic banking [31], a wireless service delivery channel [32], an application of m-commerce [10], an innovative method for accessing banking services [33] that offers additional value for customers by providing "anytime, anywhere" access to banking service [32]. In particular, Kim et al. [10] and Luakkanen and Passanen [34] viewed m-

banking as a potential platform for automated banking and other financial services which enables customers to access bank accounts through mobile devices or personal digital assistant to conduct and complete bank-related transactions such as balancing cheques, checking account statuses, transferring money and selling stocks. For the current study, this definition was considered as it represents the m-banking scenario in the best possible mode.

Goswami and Raghavendran [5] debate the general goal of m-banking is to ensure the presence of a financial institution on a mobile phone. This view was further supported by Crosman [35] who stated that m-banking facilitates for users to have a bank branch in their pocket at any convenient time and place. Indeed, as asserted by Coelho and Easingwood [36], some consumers are less willing to visit traditional branches and are more receptive to bank virtually through new electronic channels such as m-banking. More importantly, m-banking is enabling consumers to conduct a variety of financial functions including micropayments to merchants, bill payments to utilities, person to person (P2P) transfers, business to business (B2B) transfers, business to person (B2P) transfers and long distance settlements [2].

RELEVANT LITERATURE

As an aim of the current research is to investigate the factors that influence consumer's acceptance and adoption of m-banking services in Jordan, the literature related to electronic banking and m-banking was reviewed. However, much of this literature is largely focused on Internet banking, whereas research focusing on m-banking in Jordan is relatively limited and receives underrated attention [37,38]. Indeed, there has been limited research conducted from Jordanian users' perspectives for enhancing the adoption and acceptance of mobile based technologies [39-41]. For example, a literature review carried out by Jaradat and Faqih [41] on the adoption and acceptance of m-technology services in Jordan, demonstrating that even though this specific technology has lately received a large scale of attention from marketers, businesses and research community, the individual acceptance and adoption of m-technology have not progressed and proliferated as expected in both developed and developing countries. Therefore, it seems that there is a gap in the existing related literature regarding the most important factors responsible for motivating and/or deterring potential consumers from adopting and using m-technology services. Consequently, this research endeavours to fill this gap in literature by identifying the m-technology adoption in the context of banking.

Although differences exist in customers' perception of their value, the literature regarding Internet banking may provide significant understandings into innovative m-banking adoption as a result of the resemblance in terms of human users facing e-commerce systems. For example, Internet banking research, such as studies conducted by Nor and Pearson [42] as well as Kim et al. [43] have

examined the fundamental constructs leading to the acceptance of Internet banking and concluded that risk and the multidimensionality of trust play a vital role. In addition, they asserted that such major constructs as social norms, perceived usefulness, perceived ease-of-use, attitude, and self-efficacy, can also be applied to the Internet banking field. In another study conducted by Tan and Teo [15], which had combined the diffusion of innovation theory and TPB to explain intention to adopt Internet banking, revealed that relative advantage, compatibility, trialability, perceived risk, perceived self-efficacy, and government support of Internet commerce are significant determinants.

Moving into the m-banking context, several studies have examined the attitude and/or intention to adopt m-banking services in different countries, apart from Jordan [7,13,32,44-46]. In the extended domain of m-banking, previous studies have attempted to identify the major set of variable related to the consumer as well as the m-banking system that are influencing users' intention to adopt m-banking. In earlier studies in this regard, different results have been provided such as Brown et al. [47] who have applied the innovation diffusion theory and added additional factors such as banking needs, perceived risk, Internet experience, subjective norms and self-efficacy in order to investigate their influence on the adoption of m-banking in South Africa. They found that relative advantage, trial periods, perceived risk and consumer banking needs are negatively related to the adoption of m-banking. In another study conducted on middle class populations by Wu and Wang [21], it was found that cost had minimal significant impact on the adoption of m-banking while perceived risk, compatibility and perceived usefulness have significant influences.

Other researchers have examined the applicability of the technology acceptance model (TAM) in m-banking context and recommended that new additional constructs should be used to examine the adoption of m-banking. For example, Lauren and Lin [44] added perceived credibility, perceived self-efficacy and perceived financial cost to the TAM and demonstrated that the extended TAM had a higher capability to predict and describe users' behavioral intention to use m-banking. In the same vein, Amin et al. [48] in a study based on TAM, found that credibility, amount of information and normative pressures significantly influence the adoption of m-banking. A more recent research, conducted by Dasgupta et al. [49], affirmed the previous view regarding the applicability of TAM, found that in addition to perceived usefulness and perceived ease of use, image, value, self-efficacy and credibility significantly affect intention towards m-banking usage, thereby providing more impetus for using TAM in the current research.

The relevant m-banking literature discussed the importance of perceived risk on adoption behavior [43,50]. For example, Lee et al. [43] found Jacoby and Kaplan's six risk dimensions [17] relevant to adoption behavior in the m-banking context. In order to better predict adoption behavior, Brown et al. [47] applied Tan

and Teo's Internet banking adoption framework to the m-banking context. Brown et al. [47] found perceived risk to be significant factors affecting m-banking adoption. However, the risk construct in their study is limited to information risk and security concerns.

Lee et al. [43] also included a perceived risk construct under the umbrella of TAM to study its impact on m-banking adoption. Different risk dimensions were examined. Their results indicate that both trust and perceived usefulness have a significant, direct impact on adoption behavior while the impact of perceived risk is only mediated by trust. According to Akturan and Tezcan [12] attitudes of students towards adopting m-banking is the most important factor that influences them to adopt m-banking. Moreover, they discovered that these attitudes are affected by the perceived benefits of using m-banking, risks associated with performance and social factors.

Based on recent research in m-banking which has confirmed perceived risk and perceived benefits as important factors influencing adoption behavior, this research extends the study of these two factors by examining different dimensions of perceived risk, perceived benefits, and their influence on customers attitude and behavioral intention. Since much of literatures are not found related to m-banking in Jordan, this paper is an endeavor to fill the research gap in this regard. Thus on the basis of the above literatures, the paper aims to examine the adoption intention of m-banking by integrating TAM with perceived benefits and perceived risks.

TECHNOLOGY ACCEPTANCE MODEL (TAM)

IT acceptance has been the subject of much research in the past two decades. Several theories have emerged that offer new insights into acceptance and use, at both the individual and organizational levels, including the theory of reasoned action (TRA) [51], the Technology Acceptance Model (TAM) by Davis [52], the extended technology of acceptance model (TAM2) [53], the Theory of Planned Behavior (TPB) [54], the innovation diffusion theory [55], and the Unified Technology Acceptance User Technology (UTAUT) by Venkatesh, Morris, Davis, and Davis [56]. One of the most salient models is the Technology Acceptance Model (TAM), when it comes to investigating the factors that influence the adoption of information systems, which is proposed by Davis [52] and is mainly developed from Fishbein and Ajzen's existing Theory of Reasoned Action (TRA). In particular, previous literature indicated that TAM consistently accounts for 40% of variance in usage intention and behaviors [53]. TAM has been widely examined and validated and is an extensively accepted model in a variety of academic disciplines. In particular, TAM has been validated by investigating different sorts of technologies related to user and organization acceptance and adoption such as the World Wide Web [57,58] Intranet [59], E-commerce [60,61] online shopping [62,63], M-commerce [64], Internet Banking [65,66].

In addition, the widespread acceptance of TAM is justified by the explicit approach it uses to address factors that influence consumers' reasons of using particular information systems [67]. One benefit that comes from using TAM or extended TAM is that these models have broadly been tested and validated which lead to their widespread acceptance. Another advantage is that these models can easily be modified and/or extended by using other theories or constructs [44,53].

According to original TAM suggested by Davis [52], two primary constructs were included namely, perceived usefulness and perceived ease of use. Perceived usefulness (PU) represents the extent to which an individual perceives that using a certain system would enhance their performance. Whereas perceived ease of use (PEOU) refers to the degree to which a person perceives that using a particular system would be free of mental and physical efforts [52]. A more recent study by Chung and Kwon [68] revealed that PU and PEOU have a significant positive influence on consumers' intention to adopt m-banking services.

Although TAM has been extensively validated, Mathison [67] argued that it is inappropriate to depend only on these two variables of PU and PEOU in examining individual's technology acceptance tendencies. Consistent with this view, TAM theory can be modified or extended using other theories or incorporating other constructs [21,44,69,70]. Singh et al. [71] propose that perceived usefulness and perceived ease of use are the main components of new technology acceptance even though they cannot explicitly explain consumers' attitude and behavior when it comes to m-banking.

Taking this point further, several previous studies suggested that there are other potential factors that might be incorporated within the TAM and which would influence users' adoption of m-banking such as perceived risk [33,34,68,72] as well as perceived benefits [12]. Consistent with this view, Chong et al. [73] asserted that it is better to use TAM as a base model and extend by including additional constructs based on the research being conducted. For example, Aldas-Manzano et al. [65] have extended the TAM by incorporating perceived risk in order to investigate online banking adoption. In the same vein, Akturan and Tezcan [12] have integrated perceived risks and perceived benefits to examine m-banking adoption among nonusers and university students in an emerging country which was considered as the main limitation for their study. In view of this, the current study has extended the TAM by incorporating perceived risks and perceived benefits to the original TAM.

CONCLUSION FOR THE LITERATURE

The scope of this study is to cover the main constructs derived from Technology Acceptance Model (TAM) [18] including attitude and intention to adopt m-banking

services, perceived usefulness, and perceived ease of use. After critically reviewing the literature that pertains the developments in Jordan m-banking situation, some important information we gathered, which is the context of this study. The variables perceived risk and perceived benefits are added to TAM in order to develop a research model to probe variables affecting adoption of m-banking in Jordan.

RESEARCH FRAMEWORK AND HYPOTHESES DEVELOPMENT

This section presents a theoretical model that conceptualizes the relationships amongst the focal constructs, that is, the impact of perceived usefulness, perceived ease of use, perceived benefits and perceived risk on consumers' attitude towards and behavioral intention to adopt m-banking in Jordan as shown in Figure 1.

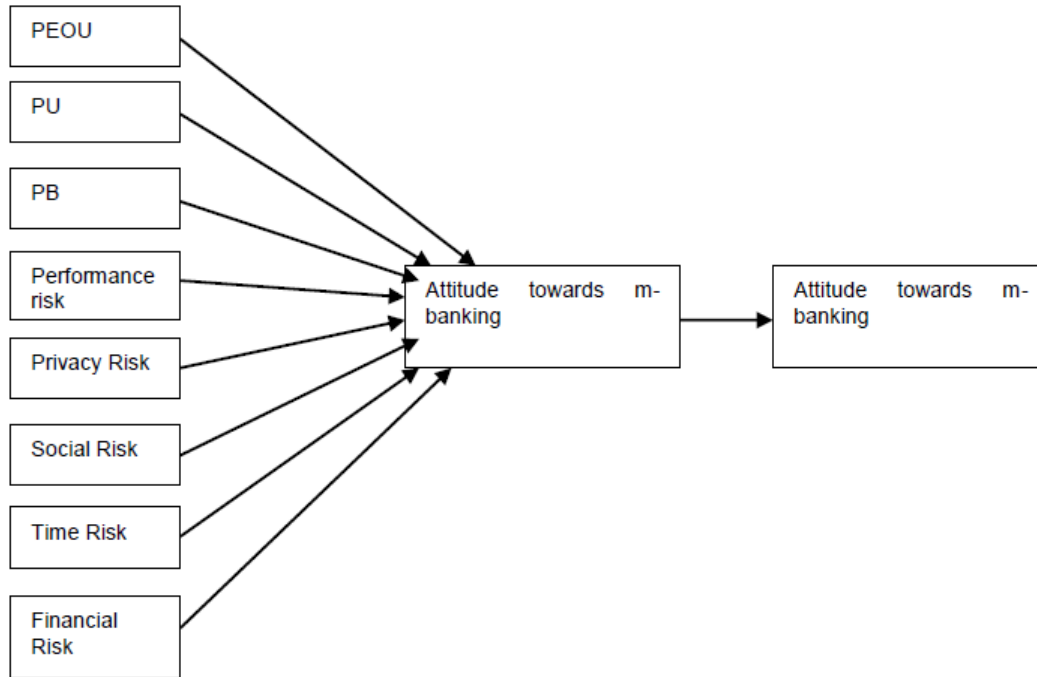


Figure 1: Proposed Research Model

Perceived ease of use

Perceived Ease of Use (PEOU) is one of the fundamental elements in TAM and is viewed as the degree of ease associated with the use of a system [74] and that using a particular system would be free of physical and mental effort [52]. In the context of m-banking, PEOU represents the degree to which a person associates freedom of difficulty with the use of banking services through mobile technology

[75]. Most of the previous behavioral decision making literature contended that individuals endeavor to reduce efforts in their behavior. In addition, extensive previous studies demonstrated that perceived ease of use had a direct and a positive significant effect on usage intention [24,65,71,76,77] users' attitude towards using a particular system [2,78] and technology adoption behavior [43,44,52,53,68,69]. Based on these studies, the following hypothesis is proposed:

H1: PEOU has a significant positive influence on customers' attitudes to adopt m-banking.

Perceived usefulness

Perceived usefulness is a critical construct in TAM in which it is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" [52]. Within the context of m-banking, perceived usefulness can be described as users' perceptions that m-banking will enhance their means of getting the bank services. According to Kim et al. [79], a person generally assesses the consequences of his/her behavior and accordingly makes a choice based on the perceived usefulness. This argument is also supported by Luarn and Lin [44] who proposes that perceived usefulness significantly affects the development of initial willingness to use m-banking. This view has been widely confirmed by many researchers by asserting that perceived usefulness is the primary antecedent of the behavioral intention to use a new technology [48,80-85]. In addition, other researchers found that perceived usefulness has a direct positive influence on consumers' attitudes towards m-banking, and that attitude was the key precursor of m-banking adoption [12]. Moreover, many previous studies have found that perceived usefulness has an influence on m-banking adoption [86,87]. Accordingly; it is hypothesized that:

H2: Perceived usefulness has a significant positive influence on customers' attitudes to adopt m-banking.

Perceived benefits

Perceived benefits refers to the degree to which an innovation provides more benefits than its precursor [10,20,79,88]. In general, Wright [89] stated that consumers tend to engage in a cost-benefit analysis when going through a decision making procedure. Taking this point further, customers when are faced with buying situations, they search for particular benefits from the product and perceive products as a bundle of attributes delivering benefits. Peter and Lawrence [90] noted that perceived risk and perceived benefits are the fundamental aspects of consumer decision-making in purchasing behaviors. Perceived benefit was found as an imperative indicator of online banking adoption. For example, Lee [91] concluded that perceived benefit is mainly and

positively related to the intention to use online banking. In the same vein, Laforet and Lin [11] figured out that the inability of comprehending these benefits was considered as an important barrier to the adoption behavior.

Moving to the m-banking context, Kim et al. [43] suggested that customers viewed perceived benefits as a cognitive and affective evaluation of utilitarian and hedonistic benefits. As m-banking is considered a technological innovation, it allows consumers to access banking transactions without restrictions of time and place via mobile devices [9]. In the current study, perceived benefits refer to a consumer's subjective perceptions about the potential positive values from the usage and transaction with m-banking service [79]. In general, when consumers recognize the benefits provided as a result of using m-banking service, they tend to have a positive attitude toward adopting (or continuing to use) and trusting m-banking [4,20,92-95]. Perceived benefits were found also to have a positive influence on behavioral intention [96].

This point was previously supported with a number of previous m-banking studies [79,97]. For example, Lu et al. [96] concluded that perceived benefit has the strongest effect on behavioral intention of m-banking usage. In addition, they found that consumers' perceived benefits of m-banking provide a major incentive for acceptance [96]. Based on the above discussion, it is suggested that:

H3: Perceived benefits have a significant positive influence on customers' attitude to adopt m-banking.

Perceived risk

Perceived risk, in the context of offline and online consumer behavior, has received a considerable attention within the literature. More importantly, a rich stream of consumer behavior literature supports the usage of perceived risk in understanding consumer evaluative and purchasing of products and services [98-100]. Previous related literature have defined perceived risk as a multi-dimensional construct [90] which is related to consumers' perceptions of subjective expected loss [90], uncertainty and potential adverse consequences of buying a product or service [101], seriousness of judgment regarding the outcomes involved [102] and the degree of risk inherent in an innovation [99,103]. Within the context of the current study, perceived risk is viewed as the users' subjective judgment of suffering a loss in pursuit of a desired outcome [61]. Taking this point further, despite the great benefits of m-banking services, concerns of risks regarding privacy, security, performance and financial issues are still vital to consumers.

There is a general agreement in the relevant literature that perceived risk is a strong influential factor influencing users behavioral intention to accept and adopt a new technology particularly, in the context of Internet banking [15,21,104] as

well as m-banking [4,47,78]. For example, a study by Tan and Teo [15] on the adoption of Internet banking, found that perceived risk is a significant determinant. Brown et al. [47] applied Tan and Teo's [15] framework to the m-banking context and determined that perceived risk was a significant factor affecting m-banking adoption.

A considerable amount of literature viewed users' perception of risk as a crucial drive to determine m-banking acceptance in different nations and settings [4,78,86,105]. For example, they found that perceived risk is a significant factor influencing consumers' intention to adopt m-banking services in many countries including Singapore [78], Australia [4], South Korea [43], South Africa [47], Brazil [95], and Germany [83]. Most of the previous mentioned studies have found that perceived risk negatively affect the users' behavioral intention to adopt m-banking technology. However, one limitation of the previous studies is that perceived risk has only been examined as a single construct which may not accurately reflect the characteristics of the risk factor [91].

Other studies have examined the influence of perceived risk in the context of Internet banking by viewing risk from into five different facets (performance risk, social risk, financial risk, time risk and privacy/security risk), which provided a more in-depth understanding of the characteristics of risks regarding Internet banking [91]. As m-banking may be considered an extension of Internet banking, but with its own unique characteristics given that a smartphone is used rather than a web browser on a PC [47], a similar set of risk factors can be derived for m-banking by using the five risk facets as used by [91], in the context of Internet banking, as a basis: performance risk, social risk, financial risk, time risk and privacy/security risk. As defined by Lee [91], these five risks can be described for m-banking as follows:

- a. Performance risk: It represents the losses incurred by deficiencies or malfunctions of m-banking servers [91].
- b. Privacy/security risk: It is defined as a potential loss due to fraud or a hacker compromising the security of m-banking user.
- c. Time/convenience risk: It is viewed as a loss of time and any inconvenience incurred due to the delays of receiving payments or the difficulty of navigation (finding appropriate services and relevant commands) [91].
- d. Social risk: It refers to the possibility that using m-banking may result in disapproval by one's friends/family/work group [91].
- e. Financial risk: It is defined as the potential for monetary loss due to transaction errors or bank account misuse [91].

Previous literature revealed that all five dimensions of perceived risks were found to have a negative impact on users' behavioral intention to adopt online banking [43,91]. Consistent with this view, earlier studies have argued that perceived financial cost [44], security issues [11,44,47], performance risks [97] are the vital constructs in affecting the adoption of m-banking services. On that basis, it is hypothesized that:

H4: Perceived performance risk has a negative influence on customers' attitudes to adopt m-banking services.

H5: Perceived privacy/security risk has a negative influence on customers' attitudes to adopt m-banking services.

H6: Perceived social risk has a negative influence on customers' attitudes to adopt m-banking services.

H7: Perceived time risk has a negative influence on customers' attitudes to adopt m-banking services.

H8: Perceived financial risk has a negative influence on customers' attitudes to adopt m-banking services.

Attitude toward M-banking and Behavioural Intention

Attitude toward m-banking has received considerable attention within the consumer behavior literature. The concept of attitude appears to play an important role in predicting and understanding consumer intention and behavior [106-110]. Indeed, consumer attitudes towards m-banking are an important indicator of customer intention to use m-banking services. Behavioural intention refers to an individual's willingness to perform [107] a specific future behaviour [111]. It has been considered an important predictor of an individual's behaviour [106,112]. Also, customer's intention toward using m-banking significantly affects the adoption of m-banking. This is line with Ajzen [54], as within the framework of the Theory of Planned Behaviour (TPB), customer's intention toward behaviour is largely influenced by consumers' attitudes. Therefore, in this study, it is proposed that customer's attitude towards m-banking will significantly affects their intention towards m-banking. Accordingly, the following hypothesis is posited:

H9: customer's attitude toward m-banking has a significant positive influence on customers' behavioural intention to adopt m-banking.

RESEARCH METHODOLOGY

Sample

The current study was designed to assess the factors affecting m-banking

adoption among Jordanian consumers. Thus, the target population of this study was the entire Jordanian population. The target population included people living in Jordan of different age groups, income levels, education levels, ethnic backgrounds, and marital status.

Data collection

A quantitative approach was used in this research. In order to empirically test the hypotheses developed in the previous section, data were collected using a convenience sampling approach via an online self-administered survey. The first reason for using this sampling technique is because it offers an easy way to collect the raw data for further analysis. Secondly, it saves time and costs as the respondents are randomly selected. M-banking was described to participants as a mobile commerce application that gives the user the opportunity to make the everyday bank transactions (such as balance inquiries, check book requests, make money transfers, etc.), mobile brokerage (trading financial instruments), and financial inquiries (bank balance, statement requests, ATM locations, foreign exchange rates, etc.) using a mobile phone or other portable devices. The participation in the study was voluntary. To increase content validity, it was indicated that the survey should be filled out by a respondent who is familiar with m-banking concept. In addition, the questionnaire was created in English and reviewed for content validity. Since it was administered to the Jordanian general population, the English version of the instrument was then translated to Arabic. Following the recommendation of Brislin [113], a professional translator reviewed the instrument for content validity.

To encourage participation and reduce self-reporting bias, all participants were given the opportunity to receive the findings of the study. To test the instrument, a pilot study was conducted among a group of 50 college students who were not included in the main survey. Consequently, the wording of some questions was modified. Preliminary evidence showed that the scales were reliable and valid. Following the pretest, the survey was sent to a user base of people with one or more mobile phones at Jordan. The survey was mainly promoted and hosted online by survey monkey website; a provider of web based survey solutions (SurveyMonkey.com). Respondents were invited to take the questionnaire by sending them the link of the survey webpage on their email addresses, Facebook pages, and via a popular mobile-device application called Whatsapp. A total of 835 e-mails were sent using personal hyperlinks that could be used only once, thus preventing repeated responses.

A follow-up reminder was sent to nonrespondents after four weeks. To encourage participation; respondents were given an incentive of a 3D photo shoot as a luck draw prize. A total of 432 responses were collected. Twenty eight responses were discarded due duplicate submissions or incompleteness, a net sample of 404 usable questionnaires remained. The common method bias was

examined using Harman’s one-factor test [93]. No significant common method bias was found in the dataset.

Measurement and scaling

A typical seven-point Likert scale was used to measure the constructs presented in the proposed model (scores were ranged from 1=“strongly agree” to 7=“strongly disagree” with neutral score=4). The conceptualization and development of the questionnaire was based on the existing literature, resulted in total of 35 items. The questionnaire instrument was developed based on the constructs of perceived usefulness, perceived ease of use, perceived benefits, perceived social risk, perceived financial risk, perceived performance risk, perceived time risk, perceived privacy/security risk, attitude to use m-banking and intention to use m-banking. Perceived usefulness, perceived ease of use, attitude to use m-banking, and perceived benefits were adapted from the measurements used by Lee [91], containing three items for the first construct and four items for the remaining constructs.

Intention to use m-banking was adapted from Kim et al. [114] and included three items. Perceived social risk, perceived financial risk, perceived performance risk, and perceived time risk were adapted from Stone and Gronhaug [115], containing three, two, five and three items respectively. Perceived privacy/security risk were adapted from Pikkarainen et al. [116], containing six items. Additional four items were included for capturing demographic information (gender, age, educational level, and marital status).

Demographic profile of the respondents

Data were gathered from a convenience sample of 404 respondents via an online survey. The data relating to respondents’ profiles were tabulated to obtain a better feel of the data, as recommended by Sekaran [117]. Therefore, the respondents’ demographic profiles were tabulated for gender, age, education level and marital status (Table 1).

Table 1: Demographic Profile of the Sample

Variable	Category	Response Information N=404
Gender	Male	63%
	Female	37%
Age	Less than 20	27%
	21-29	47%
	30-30	13%
	40-49	10%
	50-59	2%

	Above 60	1%
Education	High School	5%
	University Degree	82%
	Higher Education	13%
Marital Status	Single	54%
	Married	44%
	Divorced	2%

As shown in Table 1, male respondents accounted for the majority of the sample (63%) and the majority of the respondents' ages were less than 29 (74%). In relation to educational level, 13% of the respondents reported completing higher education, while 82% reported achieving a university degree. For marital status, single respondents accounted for the majority of the sample (54%).

RESEARCH RESULTS

To test the model, a two-step method was used, beginning with the measurement model to examine the reliability and validity of the instrument and then analyzing the structural model [118]. Since the research is an early stage assessment of m-banking situation in Jordan, the partial least squares (PLS) is the most appropriate method for this study [119,120]. PLS estimation requires ten times the largest number of structural paths directed at a particular construct in the model [121,122]. The sample in our study met the necessary conditions for using PLS.

Measurement model

Tables 2 and 3 present the measurement model results. Composite reliability (CR) is above 0.70 (minimum CR is 0.90) indicating that the scales have internal consistency (Table 2). To evaluate the indicator reliability, we opted to consider the loadings above 0.70. Hence two items, SR2 and FR1, were eliminated. As seen in Table 2, the instrument presents good indicator reliability as the loadings are above 0.70. Average variance extracted (AVE) was used to test convergent validity. AVE should be higher than 0.50 so that the latent variables explain more than half of the variance of its indicators [120,123]. As seen in Table 2, all constructs meet these criteria. The AVE, CR, and Alpha values are higher than the recommended thresholds of 0.500, 0.700, and 0.770 respectively [122,124,125]. This demonstrates convergent validity and validity indicating that the constructs can be used to test the conceptual model.

Table 2: Individual Item Reliability and Construct Validity

Construct	Factor	Loadings	AVE	Composite Reliability	Cronbach's Alpha
Perceived Ease of Use	PEOU01	.826	.723	.887	.809
	PEOU02	.851			
	PEOU03	.873			
Perceived Usefulness	PU01	.867	.738	.919	.882
	PU02	.885			
	PU03	.903			
	PU04	.776			
Perceived Benefits	PB01	.747	.640	.841	.717
	PB02	.817			
	PB03	.833			
Perceived Performance Risk	PR1	.948	.897	.946	.886
	PR2	.947			
Privacy/Security Risk	PRIV1	.909	.690	.929	.910
	PRIV2	.910			
	PRVI3	.828			
	SEC1	.839			
	SEC2	.754			
	SEC3	.727			
Social Risk	SR1	.707	.559	.779	.750
	SR3	.970			
Time Risk	TR1	.855	.742	.86	.839
	TR2	.958			
	TR3	.76			
Financial Risk	FR2	.872	.634	.864	.871
	FR3	.921			
	FR4	.912			
Consumer Attitude Towards Banking	ATT01	.888	.784	.936	.908
	ATT02	.852			
	ATT03	.926			
	ATT04	.875			
Intention to Adopt Banking	INT01	.905	.779	.914	.858
	INT02	.839			
	INT03	.902			

Finally, discriminant validity was tested based on the square root of AVE for each construct should be greater than the correlations with all constructs [123,126]. In Table 3, we can see that the square root of AVE (in bold) is higher than the correlation between constructs.

Table 3: Latent Variable Correlations

PEOU	.850									
PU	.679	.859								
PB	.705	.718	.800							
Per Risk	.102	-.109	-.021	.947						
Privacy	.046	.302	.462	-.06	.830					
Social	.047	.113	.240	-.033	.410	.747				
Time	-.237	-.17	-.271	.645	-.166	.147	.861			
Fin Risk	-.175	-.116	-.187	.502	-.448	.0147	.650	.798		
Attitude	.544	.57	.665	-.091	.577	.344	-.232	-.263	.885	
Intention	.475	.41	.458	-.296	.48	.293	-.355	-.373	.713	.882

The measurement model results indicate that the model has good internal consistency, indicator reliability, convergent validity and discriminant validity. Hence, the constructs from our model are statistically distinct and can be used to test the structural model.

Structural model

The PLS results, as shown in Table 4, indicate that perceived ease of use of m-banking has a significant positive effect on users (consumers) attitude towards m-banking adoption ($\beta = 0.143$, $t = 2.557$, $p < 0.01$), indicating that users who perceived m-banking as easy to use, tend to have positive attitude towards using m-banking, thereby, supporting H1. As proposed in H2, a significant positive relationship between perceived usefulness and consumer attitude towards m-banking was found ($\beta = 0.171$, $t = 2.465$, $p < 0.01$), suggesting that those consumers who perceive m-banking as useful are more likely to have positive attitude towards m-banking. This finding supports H2. Consistent with H3, perceived benefits of m-banking has a significant positive effect on consumers' attitude towards m-banking ($\beta = 0.245$, $t = 3.032$, $p < 0.01$), implying the greater the benefits of m-banking the more positive the attitude toward m-banking, thereby supporting H3. Further, privacy/security risk ($\beta = - 0.305$, $t = 3.811$, $p < 0.01$) and social risk ($\beta = - 0.146$, $t = 3.055$, $p < 0.01$) are statistically significant in explaining consumer attitude towards m-Banking, thus, supporting H5 and H7. Whereas, performance risk, time risk, and financial risk are not statistically significant in explaining consumer attitude towards m-Banking. Consequently, H4, H6, and H8 are not confirmed.

The results also indicate that privacy/security risk and perceived benefits are the most important constructs in explain consumer attitude towards m-Banking. Consistent with H9, attitude toward m-banking has a significant positive effect on intention to adopt m-banking ($\beta = 0.713$, $t = 19.461$, $p < 0.01$) implying that the more positive the attitude toward m-banking the greater the intention to adopt m-banking supporting H9. Overall, within the nine hypotheses formulated, only six are confirmed by the data. Table 4 summarizes the empirical results of the

research hypotheses.

Table 4: Partial Least Squares Results for the Theoretical Model

Predicted Variable	Predictor Variable	Hypotheses	Path	R Squared	T-statistics
Attitude towards M-Banking	Perceived Ease of Use	H1	.143	.58	2.557
	Perceived Usefulness	H2	.171		2.465
	Perceived Benefits	H3	.245		3.032
	Performance Risk	H4	-.002		0.036
	Privacy/Security Risk	H5	-.305		3.81
	Social Risk	H6	-0.146		3.055
	Time Risk	H7	-0.084		1.174
	Financial Risk	H8	.018		0.222
Intention to adopt M-Banking	Attitude Towards M-Banking	H9	.713	.51	19.461

As shown in Table 4, the average variance accounted (AVA) for in the endogenous variable by the exogenous variables was 0.53 (53%). In addition, the data indicates that 58% of the variance in consumer attitude towards m-banking is explained by perceived ease of use of m-banking, perceived usefulness of m-banking, perceived benefits of m-banking, perceived social risk and perceived privacy/security of m-banking. Additionally, attitude towards m-banking accounts for 51% of the variance in intention to adopt m-banking.

DISCUSSION AND IMPLICATIONS

The results of this study provided support for the research model and for most of the hypotheses regarding the relationship among the model's variables. In particular, the research model presented in this paper is unique in that it synergistically combines the TAM variables along with perceived benefits, the various dimensions of perceived risks, attitude and behavioral intention in evaluating the decision to adopt m-banking. The interpretation of the results based on the empirical findings is discussed below.

The study demonstrates the applicability of the TAM to a mobile setting, and the

empirical results strongly supports the extended TAM in predicting individual's attitudes and intentions to adopt m-banking. Particularly, the overall explanatory power of the current research model had an R-square of 52% for consumer intention to use m-banking and an R-square of 58% for attitude towards using m-banking, implying that the extended model had the capability of explaining a relatively high percentage of variation of consumer attitude towards and intention to adopt m-banking in Jordan. In addition, the current study found that consumer attitude towards using m-banking was significantly impacted by privacy/security risk, perceived benefits, perceived usefulness, social risk, and perceived ease of use, in their order of influencing strength. Whereas, performance risk, time risk and financial risk did not play a salient role in affecting consumer attitude towards using m-banking. Consumer intention to adopt m-banking was significantly impacted by consumer attitude towards using m-banking.

Privacy and social risks have emerged as negative factors influencing consumers attitude towards m-banking and consequently their overall intention to adopt m-banking. First, the empirical evidence of the current research indicates that the privacy/security risk is the most important and powerful factor in negatively influencing customers' attitudes towards using m-banking, implying that those consumers who perceive m-banking as insecure platform and who have concerns about fraud and identity theft were more likely to have negative attitude towards using m-banking. For this reason, the first priority for Jordanian banks is to provide encryption and ensure strong authentication in order to avert fraud and identity theft.

Second, social risk was found to have a significant negative impact on consumer attitude towards using m-banking and was the third powerful inhibitor to the adoption of such services. This indicates that Jordanian consumers care about social pressure from their reference groups with regards to m-banking acceptance. This implies that m-banking is not very popular among the Jordanian community and most respondents have family or friends or work colleagues who have unfavorable perceptions towards such service.

Third, the results indicate that the influence of performance, time, and financial risks on attitude towards using m-banking were insignificant. The insignificant impact of performance risk on attitude implies that consumers do not care about the risk of mobile platform malfunctioning. Moving into time risk, it appears that m-banking users have no worries about delays in conducting mobile transactions and they may be not concerned about the waiting time required for the mobile platform to operate. Therefore, it can be said that the probability of delays of payment and waiting time are not vital issues to be considered by m-banking providers. This result is inconsistent with previous research conducted by Lee [127] in the Internet banking context. Financial risk was found to have insignificant influence on attitude, implying that most respondents did not find financial transactions as an inhibitor factor to the adoption of such services,

which is inconsistent with the findings of Lee [127]. This emphasizes the fact that m-banking users are not concerned about potential monetary loss due to transaction errors or bank account misuses. This may be due to the fact that the banks' staff provided assurance about the efficiency of m-banking transactions in Jordan.

The findings of the study also indicate that consumer attitude to use m-banking is strongly and positively affected by perceived benefits suggesting that perceived benefit is the most significant positive predictor of consumer attitude towards using m-banking, which is consistent with Featherman and Fuller [97] and Lee [127]. Taking this point further, consumers seem to be more likely to form a positive attitude and intention to use m-banking service when they perceive such service to save time, offers a wide range of service and can save the transaction handling fees.

Regarding perceived ease of use, the empirical evidence in the current study is consistent with many previous studies including Kim et al. [79], Taylor and Todd [69], Chitungo and Munongo [2], and Riquelme and Rios [78], Moon and Kim [77], Wu and Chen [70] and Yu et al. [86] which concluded that ease of use had a direct effect on attitude toward use. That is, the current study supports that perceived ease of use plays a determinant role in influencing consumer attitude towards using m-banking, which in turn leading to greater acceptance of m-banking. However, this finding contradicts prior research that considers perceived ease of use as a basic requirement for system design and should not have an influence on attitude in the later stages of adoption [52,128-130]. Based on the research findings, such perceived ease of browsing, identifying information and performing transactions should facilitate favorable and persuasive individual experience.

The data analysis also indicated that perceived usefulness of m-banking has a significant positive influence on consumer attitude towards m-banking. That is, respondents of the current study contended that the nature of the information provided through m-banking is considered as valuable motivations that lead them to react favourably and positively towards such services. When m-banking is perceived as useful, consumers' attitudes towards m-banking will be more favourable. This finding is consistent with previous studies within the m-banking context [6,8,19,76,78,114,131]. Based on the research findings, m-banking should be informative about new products and must demonstrate usefulness for consumers.

Moreover, consumer attitude towards m-banking was found to have a strong positive influence on consumer intention to use and adopt m-banking in Jordan. This conclusion has been confirmed by many previous studies stating that there is a direct relationship between consumer attitudes and consumer behavior within various contexts [126,132,133]. Moreover, attitude is predicted jointly by

perceived ease of use, perceived usefulness, perceived benefits, perceived privacy/ security risk and perceived social risk suggested that the inclusion of attitude in the research model is meaningful and significant.

Theoretical implications

The current study contributes to theory within the areas of m-banking and consumer adoption behavior. From a theoretical perspective, the results of the study provide new information related to consumer attitude towards and intention to adopt m-banking that have not been previously examined, to a large extent, in the existing related literature. Thus, the study adds to and expands our knowledge of the most important factors influencing consumer attitude and behavioral intention towards adopting m-banking services. In doing so, the current research has applied proven theory and constructs in traditional banking, online banking and m-banking research, and has extended and validated the theoretical relationships between the focal constructs in the research model. In particular, this model has extended our understanding of the most important predictors of consumer adoption of m-banking in Jordan by synthesizing theories from the m-banking literature.

The study has also extended existing theory via the specification of the research model in relation to PLS causal modelling research, through the conceptualisation of the relationship among the focal constructs. In determining the appropriate epistemic relationships between the constructs and their measures, the proposed model identified all focal constructs, in a reflective mode. In addition, PLS enabled the simultaneous testing of the focal constructs including perceived ease of use, perceived usefulness, perceived benefits, perceived performance risk, perceived privacy/security risk, perceived social risk, perceived time risk, attitude toward m-banking, and intention to adopt m-banking, as well as their underlying measures within their nomological network.

In examining the simultaneous relationships among the set of variables within the research Model, a more accurate representation of the topic being investigated has been obtained. Moreover, the study has provided a further confirmation of the relationships discussed in previous online banking and consumer behaviour literature via an examination within the m-banking context. Such relationships include a direct link between perceived usefulness and attitude towards m-banking [12], the positive influence of perceived ease of use on attitude [2,78], the (positive) relationship between perceived benefits and attitude [92], the negative association between social risk and attitude [12], and the positive relationship between attitude and behavioural intention [106,107,110].

In addition, the study makes a strong contribution to the current m-banking literature by extending TAM to include perceived benefits and the five facets of perceived risk. That is, previous TAM studies in the context of m-banking [22-24]

did not include the importance and influence of perceived benefits and perceived risk; as a consequence, they may have omitted crucial factors that influence consumer adoption of m-banking. More specifically, most of previous m-banking studies have modelled perceived risk variable as a single construct, which according to Lee [91], may fail to reveal the actual characteristics of perceived risk. Taking this point into consideration, the inclusion of the five facets of perceived risk in the research model may provide a greater understanding of the perceived risks of adopting m-banking and assist in exploring which risk dimensions are more important in this domain.

Also derived from the examination of the role of perceived benefits and the five facets of perceived risks, from a consumer perspective, was the theoretical implication related to contribution made to the current m-banking knowledge; namely, the first empirical evidence that perceived benefits and two perceived risks facets including privacy/ security and social risks all have significant effects on consumer attitude towards m-banking adoption.

Practical implications

The value of research in the area of marketing lies in its ability to be applied in practice. In this sense, the value of this research is that it expands our understanding of m-banking by identifying and synthesising the most important factors influencing customer adoption of m-banking services in Jordan. The practical implications of these findings are that they add to the understanding of m-banking from a consumer's behaviour perspective and, therefore, act as a valuable base for banks.

Specifically, the findings highlight the need for practitioners to understand that customer attitude towards m-banking represents an important aspect of the consumer acceptance and adoption of such service. That is, when consumers perceive that using m-banking is pleasant and a good idea, wise to use and find it desirable, they will be more likely to adopt m-banking services. Moreover, the findings suggest that particular factors (perceived ease of use, perceived usefulness, perceived benefits, perceived privacy/security risk, and perceived social risk) will determine customer attitude towards m-banking which in turn will influence their behavioural intention to adopt m-banking services. Therefore, perceived ease of browsing, identifying information and performing transactions should facilitate favourable and persuasive individual experience. In addition, m-banking services should be informative about new products and must demonstrate usefulness for consumers. Also, banks should attempt to enhance consumers' perceptions of the beneficial features and nature of m-banking. Marketing activities should focus on the tangible and immediate benefits of using m-banking services including quicker financial transaction speed, broader varieties of financial services, and enhanced financial transparency. Concurrently, social and privacy/security risks related to the new innovation

should be strongly minimized. Thus, banks should search for risk-reducing strategies that might contribute in arousing high confidence in prospecting customers. Taking this point further, it is suggested to focus on the prevention of intrusion, fraud and identity theft through the development of trust-building mechanisms to attract customers. Such mechanisms include long-term customer service, statement of guarantee for every transaction and digital receipts and enhancing security control when designing and updating banking apps.

CONCLUSION

This study is considered valuable to the Jordanian banking sector as it provides a unique and significant managerial and practical contributions as it has focused on the customers' perceptions factors as the major important factors influencing attitude and adoption of m-banking services. This study proposed a model which extended TAM along with risk and benefit perceptions to explain and predict customers' attitudes towards m-banking and behavioural intention with regard to such service. A more comprehensive investigation was added to the current research model by incorporating the five facets of perceived risks along with perceived benefit construct to explore the positive and negative aspects of m-banking. The findings of the current study demonstrate that the proposed model has good explanatory power and approves its robustness in predicting consumers' behavioural intention to adopt m-banking.

Notwithstanding the above findings, this research has some limitations which should be dealt with in future studies. As the current research is applying the survey-based method, it could be argued that this method is prone to the inherent limitation of measurement errors. However, the measurement errors were reduced, as indicated by the study's good reliability and validity results reported in Tables 2 and 3. The current study emphasised on examining consumers' intentions and perceptions rather than their actual behavior. The results by no means are conclusive towards users' actual behavior for adopting m-banking services. Research findings can be substantiated to a rational extent using the causal relationship that exists between intentions and behavior [69]. Nonetheless, more accurate outcomes may be obtained by assessing the actual behavior of m-banking uses.

In future research, it is necessary to verify the results through investigations in other developed and developing countries in order to be able to generalize the findings. This is because the adoption and usage of m-banking are highly varied across countries with different adoption levels and perceptions. In addition, the current study used cross-sectional survey to examine customers' adoption of m-banking where the data were collected at the same point of time. It was indicated that customers' perceptions may change over time when consumers have gained more experience [67]. Thus, future research is needed to replicate and validate the findings using a longitudinal research which would allow for further

examination of m-banking adoption at multiple points of time, thus, allowing for tracking customer decision adoption process which may change and fluctuate over time. Another opportunity for future research is to extend the model to include other variables such as culture, facilitating conditions, and perceived cost in order to examine their impact on customer adoption of m-banking.

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