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Determining customer acceptance of digital-only banks in South Africa: Unified Theory of Acceptance and Use of Technology extension

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Background: The rise of fintechs has improved many aspects of financial services and has enhanced financial products, improved access, reduced prices of financial services and brought convenience for consumers. South Africa is also experiencing an increase in these technologies. Despite this increase and benefits, their adoption is disappointingly low. Therefore, it is essential to understand the views of consumers and the extent to which they are adopting fintech.

Objectives: This study aimed to investigate factors influencing consumers to use fintechs in South Africa. The first objective was to investigate the factors influencing consumers to use digital-only banks in South Africa. The second objective was to determine if perceived convenience, ubiquity, perceived costs, perceived risk, perceived trust, facilitating conditions and self-efficacy affect fintechs adoption.

Method: An online survey was conducted among 120 bank customers. SPSS 28 and Amos 27 were used for data analysis.

Results: Facilitating conditions, perceived trust, convenience and ubiquity, self-efficacy, perceived costs and perceived risk were the key determinants for the adoption of fintechs.

Conclusion: Facilitating conditions, perceived trust, convenience and ubiquity and self-efficacy have a positive relationship with adopting fintechs, while perceived costs and perceived risk negatively affect the adoption of fintechs.

Contribution: The study's findings will help financial institutions in South Africa develop behaviour change strategies that will assist consumers in adopting fintechs. This research contributed to developing a digital-only bank adoption framework for South Africa. This framework will help financial institutions create an environment encouraging and enabling more customers to adopt fintechs.

Keywords: UTAUT; fintechs; financial technologies; adoption; acceptance; user intention; technology; digital-only bank; TAM.

Introduction

Despite financial institutions investing heavily in financial technologies (fintechs), the rate of adoption is still below the expected levels (Zhou, Lu & Wang 2010), especially in developing countries (Sharma, Singh & Sharma 2020). There is, therefore, a significant need to explore the factors that motivate individuals to adopt these technologies (Savić & Pešterac 2019). Research in technology adoption has determined factors that affect individuals' behavioural intention to use various technologies (Al-Saedi et al. 2020). Several models have contributed to the understanding of these factors (Yang 2009). The prominent is the Technology Acceptance Model (TAM) (Davis 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003).

Many studies have been conducted investigating consumers' adoption of mobile payment (Al-Saedi et al. 2020) and mobile banking (Asnakew 2020), but few studies have investigated the adoption of other financial technologies like cryptocurrency, digital (-only) banking (Sharma et al. 2020). To investigate factors influencing fintech adoption in South Africa, this study used the Technology Acceptance Model (TAM) and the UTAUT as underpinning theories.

Therefore, the research aimed to investigate factors influencing consumers to adopt fintechs in South Africa. This was done by answering two research objectives, that is, to investigate the factors

influencing consumers to use digital-only banks in South Africa and to determine if ubiquity, perceived costs, perceived risk, perceived trust, facilitating conditions, self-efficacy, hedonic motivation, social influence, effort expectancy, performance expectancy, perceived usefulness, perceived ease of use affect fintechs adoption in South Africa.

Problem statement

The rise of fintechs has created several opportunities for the financial services industry, including the ability to provide services and financial products to people who were previously excluded or underserved, improve the efficiency and delivery of services and products, and save money on operating costs. Fintechs also benefit consumers in a variety of ways, including lower transaction fees, the provision of a variety of products tailored to consumers' needs, and the convenience of accessing financial services at any time and from any location. As good as it is, none of these benefits will be realised unless consumers adopt these fintechs.

Studies have shown that, despite all of these positive effects and fintechs gaining widespread acceptance in developed countries, adoption in emerging economies such as South Africa remains a significant challenge (Sharma et al. 2020). This lack of adoption poses serious risks to financial institutions that have invested heavily in fintechs. As a result, financial institutions must learn about the factors influencing consumers' adoption of fintechs. As a result, financial institutions are looking for ways to encourage consumers to use fintechs. Knowing the factors influencing consumers to adopt fintechs will provide financial institutions with comprehensive information about behaviour change strategies that will increase adoption (Savić & Pešterac 2019).

Literature review

Financial technologies in South Africa

Fintechs have fundamentally changed business models and value propositions in financial services. They have made this industry more accessible and inclusive by extending services to the underserved and previously neglected. The key drivers of these changes have been the increase in the use of mobile phones and the Internet. At the end of the 20th century and the beginning of the 21st century, South Africa experienced a substantial increase in the use of mobile phones and the Internet (Singh 2004). This sparked new changes in the industry as the financial services institutions saw new opportunities in using mobile phones and the Internet to deliver their services (Brown et al. 2003).

It began in 1996 when Amalgamated Bank of South Africa (ABSA) introduced internet banking with what they called 'freenet'. Customers favoured the ease, security, and low prices of this platform which offered online banking, notwithstanding the initial slow growth. Nedbank immediately followed ABSA. The trend was quickly followed by Standard Bank, First National Bank and Mercantile Bank, respectively (Singh 2004). ABSA, however, stopped supporting its 'freenet' in June 2002 and unveiled a new mega-portal platform that included e-procurement services, Customer relationship management (CRM), which acted as a 'platform' for small, medium and micro-enterprises. Standard Bank expanded its internet offerings to include international banking, share trading and foreign exchange services. Additionally, they unveiled a secure email statement service that clients could only access with online investing accounts. This allowed the customers to open, amend and manage investment accounts online. In response, First National Bank (FNB) partnered with Commerce One to provide e-procurement services and promote local and international trading (Singh 2004).

These changes showed that traditional banks in South Africa have always wanted to respond to emerging financial technologies and ensure that their infrastructure is agile enough to adapt (Camarate & Brinckmann 2019). As the changes continued, in 2004, Discovery launched its credit card. Ten years later, in 2014, ABSA developed a digital strategy in response to the changes. In 2015, several industry changes were witnessed. Old Mutual partnered with Bidvest Bank to launch the Old Mutual money account; FNB launched its first mobile banking platform, which catered for the unbanked, mainly rural communities; South African Reserve Bank (SARB) granted Postbank and Tymebank provisional licences. In partnership with WIZZIT International, U Bank also launched a digital payment platform and PEP stores launched PEPplus debit cards. In 2016, Standard Bank acquired SnapScan and formed Human Settlement Development Bank. In 2017, Capitec launched its credit card. In 2018, Bank Zero was registered with SARB (Camarate & Brinckmann 2019). In 2019, Tymebank started trading, and in July 2019, Discovery Bank opened its service to the public. In August 2021, Bank Zero officially launched for public access. In all these industry changes, it has always been imperative that the consumers find these new technologies useful and adopt them.

Technology acceptance models

Technology acceptance model

Davis (1989) developed Technology Acceptance Model. This model postulates that an individual's behavioural intention to use technology is determined by two beliefs: perceived usefulness, defined as the extent to which a person believes that using the technology will improve the performance of his or her job, and perceived ease of use, defined as the extent to which a person believes that using the technology will be effortless (Davis 1989; Venkatesh & Davis 2000). The technology adoption model claims that the impact of external variables (e.g. technology features, development process, training) on intention to use is mediated by perceived usefulness and perceived ease of use. According to TAM, perceived usefulness is also affected by perceived ease of use because, other things being equal, the simpler it is to use, the more useful it can be (Davis

1989). In 2000, Venkatesh and Davis expanded the TAM model by adding more constructs. The resultant model was named TAM2. Technology adoption model 2 extends TAM by demonstrating that the subjective norm has a significant direct effect on the purpose of use over and above the perceived usefulness and ease of use of mandatory (but not voluntary) technologies. Subjective norms significantly affect perceived usefulness by both internalisations, in which people integrate social influences into their own perceptions of usefulness and identification, in which people use the mechanism to gain prestige and power within the working community and thereby enhance efficiency (Venkatesh & Davis 2000).

Unified theory of acceptance and use of technology

Some scholars criticise the TAM model, arguing it is not comprehensive because it has several disadvantages, including, (1) inability to provide enough insights into individuals' perspectives of novel technologies, (2) neglecting its indicators and direct investigating the external variables of perceived ease of use, and perceived usefulness (Lou & Li 2017), (3) ignoring the relationship between usage attitude and usage intention (Chao 2019), and (4) whether it can be applied to all the cases of new technology adoption (Lou & Li 2017). Therefore, a coherent paradigm that incorporates different viewpoints on consumer acceptance and innovation, the UTAUT, was developed to harmonise the literature associated with the adoption of emerging technologies (Williams et al. 2015).

Unified Theory of Acceptance and Use of Technology integrated core elements from eight models and prominent theories (including the theory of reasoned action [TRA], innovation diffusion theory [IDT], the theory of planned behaviour [TPB], the TAM, the combined TAM-TPB, the motivational model [MM], the model of PC [personal computer] utilisation [MPCU] and social cognitive theory [SCT]). The UTAUT theory argues that four main constructs affect technology adoption: (1) performance expectations, (2) effort expectations, (3) social influence and (4) facilitating conditions. The first three are direct determinants of usage intention and behaviour, and the fourth is a direct determinant of user actions. Other variables, gender, age, experience and voluntariness, moderate the influence of the four main constructs on the intent and behaviour of usage (Venkatesh et al. 2003).

Scholars in technology adoption, such as Brown et al. (2003) and Savić and Pešterac (2019), have used various models to study consumers' adoption of technologies. Research has shown that the UTAUT model is the most influential and provides a better understanding of the variance in the behavioural intention to use a technology (Savić & Pešterac 2019; Venkatesh et al. 2003). Consequently, several models that are extensions of UTAUT have been developed to investigate if more constructs significantly influence fintech adoption by consumers.

Sharma et al. (2020) extended the UTAUT model with the addition of perceived risk, customer satisfaction and two of Hofstede's cultural dimensions – individualism vs collectivism (IVD) and uncertainty avoidance (AU). They posited that uncertainty avoidance dampens the influence of performance expectancy and facilitating conditions on internet banking adoption intention. Sharma et al. (2020) emphasised the importance of individual's cultural values in promoting the adoption of internet banking.

Venkatesh et al. (2013) modified the generalisability of the UTAUT model from the organisational context to the consumer context by including hedonic motivation, price value and habit and developed UTAUT2.

This study adopted UTAUT because of its comprehensiveness and influence on technology acceptance.

Determinants of adopting financial technologies

The financial services industry in South Africa was shaped by the country's history that has changed significantly through the years, starting from the apartheid regime through to the democratic government administration, and the poor adoption of financial technologies is embedded in the history and the infrastructure of this country.

This study adapted constructs from UTAUT (performance expectancy, effort expectancy, social influence and facilitating conditions), UTAUT2 (hedonic motivation) and TAM (perceived usefulness and perceived ease of use). Other constructs that have been added in the extension of UTAUT, that is, perceived cost (Yu 2012), perceived trust (Koufaris & Hampton-Sosa 2004; Shin 2009; Luarn & Lin 2004), perceived risk (Brown et al. 2003), ubiquity (Kim et al. 2015) and self-efficacy (Shin 2009) were also added because of their importance in the context of South Africa:

- Perceived costs: Because South Africa is a developing country with a high employment rate, the cost is essential in adopting fintechs.
- Perceived risk: Because fintechs are linked to cybercrime, there is a risk that a consumer's banking information will be compromised when transacting digitally.
- Perceived trust: The consumer's trust in the financial institution is critical to their relationship. South African consumers recently lost large sums of money in a scandal that involved the now-defunct VBS bank. As a result, they are very sceptical of a new entrant into the banking industry.
- Ubiquity: Because South Africa is considered a dual economy (one part comparable to a developed country and the other to a developing country), people on the more affluent side value convenience that comes from ubiquity very highly, while people on the poor side prioritise costs.
- Self-efficacy: Digital-only banks are a new concept in South Africa. As a result, many consumers will first assess whether they have the capabilities to use these banks before they can start using them.

The following section discusses the determinants of fintechs adoption used in this study.

Facilitating conditions

Facilitating conditions are the environmental factors that enhance an individual's likelihood to use technology or the degree to which an individual believes that (technical) infrastructure exists to enable them to use a technology (Venkatesh et al. 2003). If the infrastructure that enables one to use the technology is not available, then one will not adopt it. Asnakew (2020) argues that facilitating conditions are some of the most significant barriers to mobile banking adoption. This agrees with the argument of Halili and Sulaiman (2019) that the lack of facilitating conditions is one of the key impediments to technology adoption. As a result, fintechs should expand or improve their infrastructure so that more customers can use fintechs.

Perceived cost

Perceived cost is the level to which an individual thinks there will be a cost incurred for using fintech (Huei et al. 2018). The cost may include the price of purchasing the compatible device and the cost of data or airtime to download and use the related applications (Al-Saedi et al. 2020). Customers demand financial services at lower costs; therefore, the perceived cost has a negative effect on consumers' intention to adopt fintech (Al-Saedi et al. 2020). If the consumers believe using fintech will cost them too much money, they will likely not use it.

Ubiquity and convenience

Ubiquity means that an individual can use fintechs at any time and place (Cao & Niu 2019). In the past, people had to go to the bank for any bank-related activity, but now, because of fintechs, financial services are delivered through one's handset and people do not need to go to a branch for every banking need. In rural and other areas where there are no bank branches, because of fintechs, people can now receive or send money at their nearest supermarkets, for example, Boxer stores. In these areas, people adopt fintech because of the convenience it brings to them. Hence, Sarkar, Chauhan and Khare (2020) argue that ubiquity is a critical factor that influences consumers to adopt fintech. Also, in urban areas, consumers have become used to the convenience and ubiquity of financial services. Consequently, they have constantly demanded them from their financial services providers (Yanagawa 2018).

Self-efficacy

Self-efficacy is an individual's assessment of their skills to succeed when using a fintech (Chao 2019). If a person believes they do not have the skills to use fintech, they will not attempt to adopt it. It is, therefore, important that the fintechs educate the consumers about fintech and how to use them. This would increase consumer awareness and understanding of the benefits of fintechs (Laforet & Li 2005). In developing countries like South Africa, many people are still not aware of the benefits of using fintech due to the lack of awareness.

Perceived risk

Perceived risk is an individual's belief in the likelihood of an adverse outcome and consequence when using a fintech (Khedmatgozar & Shahnazi 2018). Tang, Ooi and Chong (2020) and Ali et al. (2021) argue that financial risk, security and operational risk are some crucial factors hindering the intention to use fintechs. Some consumers believe there is a risk associated with using fintechs, so they are reluctant to adopt them. Many consumers still feel that their credentials are not safe when transacting online; as a result, they prefer to transact the conventional way.

Perceived trust

Perceived trust is the extent to which an individual believes fintech is reliable and safe to use (Al-Saedi et al. 2020). Laforet and Li (2005) add that the lack of credibility trust, and security are among the key barriers to adoption. Liébana-Cabanillas et al. (2020) argue that perceived trust significantly influences the intention to use fintechs. As a result, many consumers fear using fintechs because of a lack of trust, especially if the technology is from an unknown institution.

Hedonic motivation

Venkatesh et al. (2012) define hedonic motivation as the pleasure or enjoyment derived from the use of technology. To that end, if people enjoy using a technology, they are more likely to adopt it, whereas if they do not find it satisfying, they will stop using it. Alalwan et al. (2018) argue that a high hedonic motivation of using a technology will enhance the benefits perceived from using this technology.

Social influence

Social influence is the degree to which an individual believes that people they hold in high regard believe they should use a new technology (Venkatesh et al. 2003). Nikou and Economides (2017) contend that social influence influences individuals' perceptions of the usefulness of technology.

Effort expectancy

Venkatesh et al. (2003) define effort expectancy as the ease with which a technology can be used. Individuals will be easily influenced and motivated to use technology if it is simple to use.

Performance expectancy

This is the degree to which the user anticipates that using a technology will make a task easier task (Venkatesh et al. 2003). When people believe that using a technology will help them complete their tasks with ease, they are more likely to adopt that technology.

Perceived usefulness

According to Davis (1989), this is the extent to which a person believes that using a technology will improve work performance. People are constantly looking for ways to

improve their work performance; as a result, if a person believes that using a specific technology will improve their performance, they will adopt that technology.

Perceived ease of use

Perceived ease of use is the degree to which an individual believes that using a technology requires no effort (Davis 1989). Individuals are constantly looking for ways to simplify the way they complete their tasks. As a result, they prefer technologies that require little effort from them.

Hypotheses formulation

The rise of fintechs has both positive and negative effects on consumers in financial services. One of the negative effects of digital transactions is the risk of cybercrime because consumers' credentials can be stolen by cybercriminals when they use fintechs. To that end, Coetzee (2018) argues that regulators place cybersecurity and client data protection at the top of their regulatory agenda. Because of their fear of cybercrime and online fraud, most consumers are hesitant to transact digitally. According to Ali et al. (2021), perceived risk has a negative impact on the adoption of fintechs. As a result, the following hypothesis was developed:

> H1: Perceived risk has a negative effect on the adoption of fintech.

Fintechs have provided numerous benefits to the financial services industry, including lower costs for financial services and products. This cost reduction has made financial services available to people who were previously excluded. However, the cost of using fintechs, such as the airtime or data required to transact digitally, discourages many consumers from using them (Humbani & Wiese 2019). Consequently, financial services institutions must reduce the transaction costs to encourage more consumers to use fintechs. The formulated hypothesis is:

> H2: Perceived cost has a negative effect on the adoption of fintech.

The use of any technology necessitates certain abilities on the part of the users. As a result, if users have doubts about their ability to use a particular technology, they may be hesitant to use it. In the case of fintechs, such as a digital-only bank, there is an increased need for consumers to be confident in their ability to use them, especially because there is usually no contact with a financial institution personnel who can assist when transacting (Chan, Ng & Ng 2020). The following hypothesis was formulated:

> H3: Self-efficacy has a positive effect on the adoption of fintech.

Several years ago, financial services could only be obtained through physical branches, which imposed numerous restrictions on consumers. Consumers had to wait for the branches to open in order to conduct transactions such as sending money to others. However, fintechs changed that narrative by providing more convenient financial services and products (CFA Institute Asia-Pacific Research Exchange 2017). With the arrival of fintechs, financial services can now be accessed outside of branches and regular banking hours. Consumers are benefiting greatly from the convenience that has come with the ubiquity of financial services. To that end, Yanagawa (2018) contends that consumers are becoming accustomed to this convenience and have begun to demand more convenience and ubiquitous financial services. Therefore, the following hypothesis was formulated:

> H4: Ubiquity has a positive effect on the adoption of fintech.

Even though fintechs provide numerous benefits to consumers, their use is still contingent on the availability of the technical infrastructure that allows consumers to use them. This infrastructure includes, among other things, mobile devices, airtime, data and (quality of) mobile networks. This infrastructure is referred to as the facilitating conditions, as explained in previous sections. Therefore, consumers cannot adopt or use fintechs unless this enabling infrastructure is available. Venkatesh et al. (2003) contend that facilitating conditions play a very important role in user behaviour and predicting future use. The following hypothesis was proposed to that end:

> H5: Facilitating conditions have a positive effect on the adoption of fintech.

According to Singh, Sahni and Kovid (2020), when using a fintech, security is more important than when using traditional financial institutions. This is because consumers' credentials are more vulnerable to cyber fraud when transacting digitally rather than in physical branches. As a result, Singh et al. (2020) contend that consumers are discouraged from adopting fintechs due to a lack of trust in digital transactions. This lack of trust may be due to a variety of factors, including the reputation of fintechs, as most consumers are unfamiliar with them, unlike traditional financial institutions such as banks. To this end, the financial service institution's reputation is critical in determining whether a consumer can use a fintech. Based on the above, the following hypothesis was developed:

> H6: Perceived trust has a positive effect on the adoption of fintech.

Research methodology

This research adopted the positivist philosophy and used an inductive approach whereby the research began with the collection of data that was relevant to the topic and making sense of the data collected. Once a substantial amount of data had been collected, the researcher started data analysis.

To carry out this study, the researcher used a quantitative research design with the use of a questionnaire survey. The researcher went to the malls and other public places and randomly selected individuals to participate in the study. Questionnaires were sent electronically via emails and WhatsApp to 400 banking individuals who agreed to participate. This sample size was found to be adequate for this research, as suggested by Saunders, Lewis and Thornhill

(2019) for populations greater than 1 million. The survey was conducted between December 2021 and May 2022.

Categorical data was used to gather demographic information, while quantifiable data was used to study the factors influencing customers to adopt financial technologies and answer the research questions. Data analysis was done using SPSS 28 and Amos 27 software. Inferential statistics were used to infer from the sample group generalisations. These statistics assisted with describing the data and enabling conclusions to be drawn about the populations from which the samples were taken, as explained by Marshall and Jonker (2010). The researcher used descriptive statistics to explain the characteristics of the groups of observations. Descriptive statistics allowed the researcher to describe what the data shows. Therefore, they provided brief descriptive coefficients that summarise the data set, representing the entire sample of the population according to the assertion by Ambrosius (2007).

A questionnaire was designed specifically for this research to measure the usage (adoption) of fintechs. In designing the questionnaire, validated scales adopted from other technology adoption studies, including self-efficacy, perceived cost, social influence, performance expectancy, perceived usefulness, perceived ease of use, effort expectancy, facilitating conditions, ubiquity, hedonic motivation, perceived risk and perceived trust were used (Appendix 1). The questionnaire was made up of 12 constructs, each with a minimum of three questions, and it was designed specifically for this study using validated scales. The respondents were required to rank their answers on a five-point Likert scale according to whether they strongly disagree, disagree, neutral, agree or strongly agree with each statement.

Before the researcher commenced data collection for this study, he applied for ethical clearance from the scientific review committee and ethics committee of the University of South Africa (UNISA) (ethics clearance reference number: 2021_SBL_DBL_016_FA). Ethical consideration ensured that informed consent was obtained before data collection commenced.

The researcher took the following preventive measures to keep his subjects' identity confidential and ensuring that they remained anonymous:

- The data were kept in a password-protected computer and accessed by the researcher only.
- The questionnaire was completed anonymously, and it excluded personal identifying information.

Findings

Although structural equation modelling (SEM) typically requires a large sample size, research has shown that SEM models can be meaningfully tested even with a small sample size. Tinsley and Tinsley (1987) argue that a minimum sample size between 100 and 150 is considered adequate for conducting SEM. This is also supported by Wolf et al. (2013). For this study, 120 out of 400 customers completed the questionnaire. This gave a response rate of 31%.

Descriptive statistics

Out of 120 responses, 1 was incomplete, so 119 were used for data analysis. Out of 119 respondents, 67 (56.3%) respondents were male, 49 were female (41.2%), 2 (1.7%) preferred not to provide their gender, and 1 (0.8%) did not choose any option; 91 (76.5%) respondents have used or use a financial technology, 27 (22.7%) do not use fintech, and 1 (0.8%) did not respond; 53.8% of respondents use more than one financial technology, 48.7% use mobile payments which is incidentally the most used financial technology worldwide (De Luna et al. 2019), 23.8% use digital-only banks, 20.2% use banking apps, 10.9% use cryptocurrency, 1.7% use landing platforms and 0.84% use crowdlending.

Reliability

Reliability analysis was done to determine the internal consistency of the factors. The Cronbach's alpha of all the constructs (self-efficacy: 0.819, perceived cost: 0.724, social influence: 0.486, performance expectancy: 0.854, perceived usefulness: 0.877, perceived ease of use: 0.815, effort expectancy: 0.893, facilitating conditions: 0.738, ubiquity: 0.791, hedonic motivation: 0.900, perceived risk: 0.697 and perceived trust: 0.764) ranged from 0.486 to 0.900. Cronbach's alpha of social influence (0.486) fell below the acceptable range of 0.7 and was deleted, as argued by Hair et al. (2010). Cronbach's alpha of all other items fell within the acceptable range of 0.70 to 0.95, as proposed by Tavakol and Dennick (2011). These values were close to one (1). Therefore, the instrument was highly reliable and had high internal consistency. This is shown in Table 1.

Exploratory factor analysis

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are the two methods for determining factor unidimensionality. Exploratory factor analysis was used to investigate the underlying theories behind the phenomena studied. It summarised the findings into smaller chunks by allocating them into distinct factors (Hair et al. 2010). Confirmatory factor analysis is used to evaluate the explanatory power of a factor model, to decide which model

TABLE 1: Reliability and means of the variables.

Items statistics	Cronbach's alpha	Means
Self-efficacy	0.819	2.266
Perceived cost	0.724	2.217
Performance expectancy	0.854	2.195
Perceived usefulness	0.877	2.289
Perceived ease of use	0.815	2.266
Effort expectancy	0.893	2.124
Facilitating conditions	0.738	2.171
Ubiquity	0.791	2.274
Hedonic motivation	0.900	2.249
Perceived risk	0.697	2.261
Perceived trust	0.764	2.153

or models best represent the data and to measure instruments that have never been tested before and hence does not include previously examined literature (Bryant, Yarnold & Michelson 1999).

The value of Kaiser-Meyer-Olkin (KMO) was 0.692 (Table 2). This indicated a good factor analysis and sampling adequacy. Tabachnick and Fidel (2019) argue that the value of KMO must be at least 0.60. Bartlett's test of sphericity was found to be statistically significant with $p < 0.001$, which is less than 0.005. Therefore, data and variables are correlated with each other and are suitable for factor analysis.

The communalities ranged from 0.457 to 0.868 and averaged 0.707 (Table 3). This was within the acceptable range. Costello and Osborne (2005) argue that if an item has a communality of less than 0.4, it may not be related to the other items and should be deleted. Therefore, items with communalities less than 0.4 were deleted.

TABLE 2: Kaiser-Meyer-Olkin and Bartlett's test.

Test	Value
Kaiser-Meyer-Olkin measure of sampling adequacy	0.692
Bartlett's test of sphericity	
Approx. chi-square	1020.409
Df	325
Sig.	< 0.001

KMO, Kaiser-Meyer-Olkin.

Following extraction, the researcher had to determine how many factors to keep for rotation. Therefore, factors with eigenvalues greater than 1.0 were retained for rotation, as advocated by Costello and Osborne (2005). These factors were:

- I do not think I would have difficulties using a mobile device to bank digitally.
- I would adopt digital banking if it had a built-in guide for assistance.
- I would adopt digital banking if someone showed me how to use it.
- I would use digital banking to do my banking transactions.
- I will have financial barriers (e.g. purchase of a compatible phone, airtime and data expenses) in order to use digital banking.
- I would like to use digital banking if the banking fees are reasonable.

Table 4 gives the total variance explained. The table shows that variables 1–6 have eigenvalues of more than one. The total variance table indicates that the first variable with an eigenvalue of 8.707 is responsible for 33.490% of the total variance. The second variable (eigenvalue of 3.211) explains 12.352%, the third variable (2.345) explains 9.020%, the fourth variable (1.431) explains 5.502%, the fifth variable (1.389) explains 5.344% and the sixth variable (1.287) explains 4.950%

TABLE 3: Exploratory factor analysis communalities.

Construct	Statement	Initial	Extraction
Self-efficacy	Q1. I do not think I would have difficulties using a mobile device to bank digitally.	1	0.725
	Q2. I would adopt digital banking if it had a built-in guide for assistance.	1	0.703
	Q3. I would adopt digital banking if someone showed me how to use it.	1	0.640
	Q4. I would use digital banking to do my banking transactions.	1	0.749
Perceived cost	Q5. I will have financial barriers (e.g. purchase of a compatible phone, airtime and data expenses) in order to use digital banking.	1	0.655
	Q6. I would like to use digital banking if the banking fees are reasonable.	1	0.672
	Q7. I believe I would have to put a lot of effort to obtain the information that would make me feel comfortable in adopting digital banking.	1	0.681
Performance expectancy	Q16. Using a digital bank can make my banking convenient.	1	0.834
	Q17. Using a digital bank can make my banking efficient.	1	0.868
	Q18. Digital banking is (would be) useful in my daily banking.	1	0.827
	Q19. Digital banking would help me do banking more quickly and save time so I can do other activities.	1	0.726
Facilitating conditions	Q33. I have the resources necessary to use digital banking.	1	0.709
	Q34. I have the knowledge necessary to use digital banking.	1	0.734
	Q35. My mobile devices are compatible with digital banking.	1	0.729
	Q36. I would like the digital banking platforms to suggest a customised path.	1	0.630
Ubiquity	Q40. Banking transactions done digitally would eliminate time constraints that I otherwise would have when I visit a branch (i.e. I can bank anytime).	1	0.734
	Q41. Banking transactions done digitally would eliminate space constraints that I otherwise would have when I visit a branch (i.e. I can bank anywhere).	1	0.750
Perceived risk	Q45. Using digital banking is a potential risk.	1	0.457
	Q46. I do not feel protected when providing personal information through a digital banking platform.	1	0.709
	Q47. There is a high chance that something wrong would occur when using digital banking.	1	0.613
	Q48. Conducting banking transactions on mobile devices is risky because one can easily lose or misplace the mobile device.	1	0.586
	Q49. I fear that while I am making a transaction through digital banking, I might make mistakes since the correctness of the inputted information is difficult to check from the mobile phone screen.	1	0.684
Perceived trust	Q52. I believe that I would get an immediate confirmation message when the transaction is completed.	1	0.803
	Q53. I expect digital banking to be reliable.	1	0.579
	Q55. I have serious doubts that the banking transactions performed digitally will work satisfactorily.	1	0.801
	Q56. The transactions done via digital banking are accurate.	1	0.774

Extraction method: Principal component analysis.

of the total variance. Cumulatively, these variables explain 70.658% of the total variance.

To meet the criteria for convergent validity, all items should load at more than 0.5, and the average variance extracted (AVE) of the constructs should exceed 0.5. In this study, all items' loading was above 0.5, and AVE exceeded 0.5, hence confirming convergent validity.

The discriminant validity was assessed using Fornel and Larcker criterion, which compares the square root of each AVE in the diagonal with the correlation (off-diagonal) of each construct (Table 5). This table also shows that the composite reliabilities (CR) for all constructs are above 0.70 and the AVE values are between 0.5 (component 6 = 0.472 rounded-off to 0.5) and 0.7. These results support the discriminant validity.

TABLE 4: Total variance explained.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings/ Total
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	8.707	33.49	33.49	8.707	33.490	33.490	6.368
2	3.211	12.352	45.842	3.211	12.352	45.842	2.984
3	2.345	9.02	54.862	2.345	9.020	54.862	5.549
4	1.431	5.502	60.364	1.431	5.502	60.364	1.623
5	1.389	5.344	65.708	1.389	5.344	65.708	3.32
6	1.287	4.95	70.658	1.287	4.950	70.658	4.576
7	0.958	3.684	74.341	-	-	-	-
8	0.815	3.133	77.475	-	-	-	-
9	0.765	2.941	80.416	-	-	-	-
10	0.692	2.662	83.077	-	-	-	-
11	0.59	2.27	85.347	-	-	-	-
12	0.562	2.162	87.509	-	-	-	-
13	0.471	1.811	89.32	-	-	-	-
14	0.459	1.766	91.087	-	-	-	-
15	0.393	1.51	92.597	-	-	-	-
16	0.337	1.296	93.893	-	-	-	-
17	0.318	1.224	95.117	-	-	-	-
18	0.266	1.025	96.142	-	-	-	-
19	0.253	0.972	97.114	-	-	-	-
20	0.225	0.866	97.98	-	-	-	-
21	0.136	0.522	98.502	-	-	-	-
22	0.124	0.479	98.981	-	-	-	-
23	0.105	0.402	99.383	-	-	-	-
24	0.075	0.288	99.671	-	-	-	-
25	0.052	0.201	99.872	-	-	-	-
26	0.033	0.128	100	-	-	-	-

Extraction method: Principal component analysis.

Note: A When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Structural equation modelling

The SEM method was used to test hypotheses and investigate relationships between variables. Structural equation modelling enabled the researcher to test and draw relationships on the paths of the model. Amos 27 was used to perform a path analysis and test model hypotheses. A key step in structural equation modelling is determining the goodness of fit of the proposed model to the data (Shi, Lee & Mayday-Olivares 2019). The most used model fit measures for SEM (χ^2/df) = 1.54 (the ratio of chi-square to degrees of freedom), p = 0.00, CFI = 0.885 (0.900) (comparative fit index), TLI = 0.900 (Tucker–Lewis Index) and RMSEA = 0.068 (root mean square error of approximation) were used to test the goodness of fit of the model. A CFI ranging from 0.611 to 0.972 (Shi et al. 2019), and an RMSEA less or equal to 0.06, is considered acceptable (Hu & Bentler 1999).

Figure 1 is the digital-only bank adoption model for South Africa. This model indicates the following:

- When perceived risk goes up by 1 standard deviation, adoption goes down by 0.150 standard deviations.
- When perceived cost goes up by 1 standard deviation, adoption goes down by 1.000 standard deviations.
- When self-efficacy goes up by 1 standard deviation, adoption goes up by 0.550 standard deviations.
- When ubiquity increases by 1 standard deviation, adoption goes up by 0.080 standard deviations.
- When the facilitating conditions go up by 1 standard deviation, adoption goes up by 1.190 standard deviations.
- When perceived trust increases by 1 standard deviation, adoption goes up by 0.290 standard deviations.

Table 6 shows the path loadings for the SEM model fit. The table shows that there is a positive relationship between adoption and facilitating conditions, perceived trust, ubiquity and self-efficacy. When these variables increase, adoption also increases. It also shows that there is a negative relationship between adoption and the perceived cost and perceived risk. When these variables decrease, adoption increases.

Discussion of findings

Previous research on fintechs in South Africa has yet to investigate the factors influencing consumers to use digital-

TABLE 5: Composite reliability, the square root of the average variance extracted (in bold) and correlations between constructs (off-diagonal).

Latent constructs	CR	AVE	Latent constructs					
			Component 1	Component 2	Component 3	Component 4	Component 5	Component 6
Component 1	0.910	0.718	**0.847**	-	-	-	-	-
Component 2	0.694	0.531	0.285	**0.729**	-	-	-	-
Component 3	0.802	0.575	0.023	–0.055	**0.758**	-	-	-
Component 4	0.694	0.531	0.376	0.351	0.301	**0.729**	-	-
Component 5	0.762	0.518	0.231	0.206	0.169	0.156	**0.720**	-
Component 6	0.641	0.472	0.269	0.340	0.081	0.323	0.315	**0.687**

CR, Composite reliability; AVE, average variance extracted.

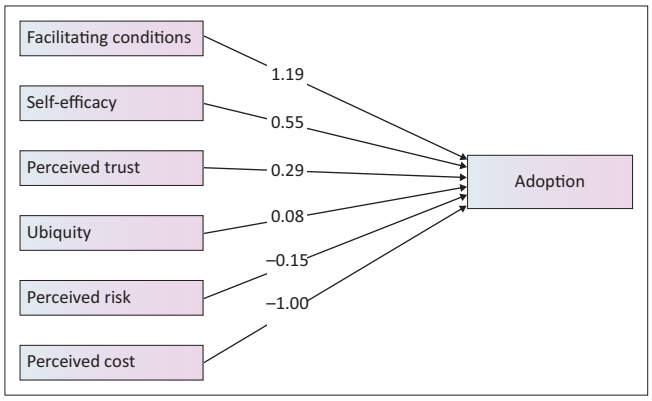

FIGURE 1: The digital-only bank adoption model for South Africa.

TABLE 6: Hypotheses test for the structural equation modelling model.

Hypotheses	Relationship	Path coefficient	Remark
H1	Perceived risk has a negative effect on the adoption of fintech	-0.150	Accept
H2	Perceived cost has a negative effect on the adoption of fintech	-1.000	Accept
H3	Self-efficacy has a positive effect on the adoption of fintech	0.550	Accept
H4	Ubiquity has a positive effect on the adoption of fintech	0.080	Accept
H5	Facilitating conditions have a positive effect on the adoption of fintech	1.190	Accept
H6	Perceived trust has a positive effect on the adoption of fintech	0.290	Accept

Note: Adoption was measured according to the usage of the digital-only bank by consumers.

only banks (fintechs). This research used a model that combined UTAUT and TAM to close this gap. The use of digital-only banks was used to explain digital-only bank adoption. According to the findings, fintech adoption in South Africa could be higher due to several challenges associated with adoption.

This study shows that perceived risk has a negative effect on the adoption of fintechs (H1). Because of their fear of cybercrime and online fraud, most South Africans are hesitant to use fintechs. The risks associated with using fintechs include exposing your banking security information (banking details such as PINs) to cybercrimes. This is consistent with the findings of Al-Saedi et al. (2020). Similarly, the findings reveal that perceived cost has a negative effect on the adoption of fintechs (H2), consistent with previous studies (Al-Saedi et al. 2020). This implies that the costs associated with using fintechs play a significant role in the use of fintechs. These costs include the cost of purchasing a compatible device (e.g. a mobile phone) and the cost of airtime and data. This implies that lower prices may result in more usage of fintechs. This makes sense in a country such as South Africa, where the unemployment rate is enormous.

The study results also show that self-efficacy has a positive effect on the adoption of fintechs (H3). This agrees with the findings by Rahi, Abd. Ghani and Ngah (2019) and Al-Saedi et al. (2020). Consumer self-efficacy can be improved by helping the consumers through the adoption journey, especially in the introduction phase, with more awareness, education, and assistance, similar to what Tymebank did when they launched in South Africa. This digital-only bank had consultants at their kiosk at Pick 'n Pay and Boxers supermarkets to assist the consumers with things such as opening a bank account. Similarly, the study reveals that ubiquity has a positive effect on the adoption of fintechs (H4). This is consistent with the findings from previous studies by Nikou and Economides (2017), Cao and Niu (2019) and Sarkar et al. (2020), which demonstrated that ubiquity affects the adoption of fintech positively. Convenience is critical for adopting fintechs in a country like South Africa, which has a dual economy and infrastructure. Consumers in affluent areas appreciate the convenience that comes with the ubiquity of fintechs. This allows them to conduct banking transactions without leaving their homes or offices. Similarly, the prevalence of fintechs has provided much-needed convenience for people living in remote areas, such as rural areas with few or no physical branches. Fintechs have enabled these people to transact without leaving their homes, which was previously a mission because they had to take multiple taxis to get to a bank branch.

The results indicate that facilitating conditions have a positive effect on the adoption of fintechs (H5). This is consistent with the findings that facilitating conditions are key factors that influence consumers to adopt technologies (Halili & Sulaiman 2019; Venkatesh et al. 2003). In a developing country like South Africa, characterised by glaring disparities in which there is a well-developed traditionally suburban areas, with modern and sophisticated infrastructure and less developed townships and rural areas, the availability of the infrastructure that enables the use of fintechs is essential for the adoption. Poor Internet connectivity and a lack of compatible devices are some of the several hindrances that prevent consumers from using fintechs.

Furthermore, the findings show that perceived trust has a positive effect on the adoption of fintech (H6). This corroborates the findings of Al-Saedi et al. (2020) that perceived trust positively influences the adoption of fintechs. Singh et al. (2020) argue that when using a fintech, security is more critical than traditional financial institutions because the consumers are not familiar with them. This suggests that consumers want to be convinced that fintechs are secure enough or that digital platforms could allow them to conduct transactions without hassles like the traditional financial institutions that have built consumer trust in years of their existence before they can comfortably adopt them.

Limitations and suggestions for future research

While every precaution was taken in conducting the study, there were some limitations. These include sample size, data collection bias, and the use of random sampling. Despite the large and diverse sample, the majority of those who completed the questionnaire live in cities. As a result, the results may have an urban bias. Furthermore, the information gathered may only reveal the position of the financial institutions represented by the survey respondents.

Furthermore, the use of random sampling may have resulted in the omission of critical perspectives from those who were not chosen. Finally, the small sample size may affect the generalisation of the results. However, despite the small sample size, some researchers argue that larger sample sizes have less variability and are more expensive (Adwok 2015). Greener (2008) warns that, while a large sample size is preferable, the sample must reflect the characteristics of the population.

Despite these limitations, this study can serve as a foundation for future research into fintech adoption in other emerging economies worldwide. Due to the study's urban bias, future research could be conducted with a focus on rural areas to see how adoption compares to urban areas. This could be significant because the availability of facilitating conditions is the biggest challenge in rural areas, as most still lack basic resources such as electricity and stable telecommunication networks, which may be linked to low adoption.

Conclusion

The results illustrate that when perceived cost and perceived risk rise, the adoption of fintechs decreases. Therefore, to increase adoption, financial institutions should try to keep the costs of using fintechs low and ensure that fintech transactions are safe and secure. In contrast, when factors such as perceived trust, facilitating conditions, ubiquity and self-efficacy increase, so does the adoption of fintechs. This implies that financial institutions must improve consumer perceptions about their brands so that consumers can trust them. Once consumer trust has improved, adoption will also improve.

Furthermore, financial services organisations should strive to provide consumers with enabling infrastructure, such as data, to increase adoption. It is also critical that financial services organisations increase their efforts to educate consumers about using fintechs. This will increase consumers' confidence in their ability to use fintechs and encourage them to adopt fintechs. Financial institutions should also raise awareness about the convenience and other benefits that fintechs provide, such as the ability for consumers to transact anywhere and at any time. Once these have been achieved, the adoption will increase.

This study has added to the body of knowledge on fintech adoption by identifying factors influencing consumers to adopt fintechs in emerging economies such as South Africa. These factors are critical in hastening fintech adoption. The findings of the study will also assist financial institutions in developing behaviour change strategies to increase fintech adoption. These strategies can include financial institutions zero-rating their apps, and providing customers with basic airtime or data so they can transact digitally. Financial institutions must ensure that consumers are safe from internet fraud and cybercrimes by providing adequate cybersecurity and other fraud prevention measures. Financial institutions should not completely eliminate human-to-human interactions. This can be accomplished by establishing call centres or by utilising technologies such as WhatsApp or other messaging platforms to communicate with customers.

Lastly, this research has also aided by creating a digital-only bank adoption model for South Africa.

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Competing interests

The author(s) declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

All authors contributed equally to this work.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of South Africa's School of Business Leadership Research Ethics Review Committee (no. 2021_SBL_DBL_016_FA).

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Data availability

The data that support the findings of this study are available on request from the corresponding author, S.C. The data are not publicly available due to their containing information that could compromise the privacy of research participants and their institutions.

Disclaimer

The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any affiliated agency of the author.

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Appendix 1

TABLE 1-A1: Questionnaire constructs.

Constructs	Meaning	Source
Self-efficacy	An individual's personal assessment and belief that he or she possesses the ability and skills to succeed when using a technology.	Chao (2019), Shin (2009)
Perceived cost or perceived value	The level to which an individual thinks there will be a cost incurred for using a technology.	Huei et al. (2018)
Social influence	The degree of the influence of others within the social environment (e.g. family, colleagues and friends) and their beliefs on the use of a technology.	Dečman (2015)
Performance expectancy	The functions and benefits that can be attained from the use of a technology in terms of convenience, customisation, accessibility, efficiency, time and effort saving.	Venkatesh et al. (2003)
Perceived usefulness	The degree to which an individual believes that using a technology would enhance his or her performance.	Davis (1989)
Perceived ease of use	The degree to which a person believes that using a technology would be free of effort.	Davis (1989)
Effort expectancy	The degree of ease associated with the use of a technology.	Venkatesh et al. (2003)
Facilitating conditions	The degree to which an individual believes that (technical) infrastructure exists to enable him or her to use a technology.	Venkatesh et al. (2004)
Ubiquity	This means that an individual can use a technology at any time and any place.	Cao and Niu (2019)
Hedonic motivation	The level of fun or pleasure an individual derives from using a technology.	Venkatesh et al. (2012)
Perceived risk	The individual's thought and belief in the likelihood of having an adverse outcome and consequence in using a technology.	Khedmatgozar and Shahnazi (2018)
Perceived trust	The extent to which an individual believes that a technology is reliable and safe to adopt.	Al-Saedi et al. (2020)