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# Perceived impact of fintech on financial inclusion in South Africa

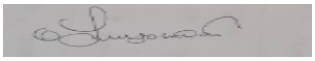
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**Thesis presented in partial fulfilment for the degree of Master of Business Administration to the Faculty of Commerce, Law, and Management, University of the Witwatersrand**

## DECLARATION

I, **Leonard Runyowa** declare that this research report entitled “Perceived impact of fintech on financial inclusion in South Africa” is my own unaided work. I have acknowledged, attributed, and referenced all ideas sourced elsewhere. I am hereby submitting it in partial fulfilment of the requirements of the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. I have not submitted this report before for any other degree or examination to any other institution.



Leonard Runyowa
Signed at Johannesburg

| | |
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## ABSTRACT

**Author:** Leonard Runyowa **Supervisor** Chengete Chakamera

**Thesis title:** Perceived impact of fintech on financial inclusion in South Africa

Globally, financial inclusion has been recognised as a critical pillar to alleviate poverty, reduce inequality, and increase economic growth. As an emerging economy, South Africa is still facing challenges of poverty and inequality and is ranked one of the unequal countries in the world (World Bank, 2013). Financial inclusion by leveraging fintech has been identified as a critical enabler for delivering affordable financial services to under-served population segments (National Treasury, 2020).

The primary purpose of this study is to determine the perceived impact of financial technology on financial inclusion in the South African context. The study's specific objectives are (i) to determine if the adoption and usage of fintech influences financial inclusion in South Africa; (ii) to determine if fintech can influence financial inclusion barriers and (iii) to determine if awareness of the benefits and risks associated with fintech influence the adoption and usage of fintech.

The study used a quantitative research strategy with a cross-sectional or survey design. An online self-completion questionnaire was used as a data collection instrument and non-probability sampling with convenience sampling method to select the respondents. One hundred twenty-five respondents completed the online survey, and data were analysed using descriptive statistics, correlation, and regression analysis.

The findings indicate that fintech adoption and usage has a positive influence on financial inclusion. The study also found that fintech influences financial inclusion barriers like distance to the nearest branch, transport costs, transaction costs, and lack of proper documentation. Consumers who use fintech products and services no longer perceive these barriers as a hindrance to financial access. Lastly, it was also found that awareness of the benefits

associated with fintech influences fintech adoption and usage. In contrast, awareness of the risks associated with fintech does not influence fintech adoption and use among the respondents.

This study will contribute to the fewer studies that have looked at the impact of fintech on financial inclusion in the South African context. The study can help the government and financial institutions understand the impact of fintech on financial inclusion and improve the current strategies implemented to increase financial inclusion in South Africa.

Johannesburg, June 2021

**Keywords**: digital financial inclusion, financial technology, financial inclusion, technology acceptance model

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## DEFINITION OF KEY TERMS AND CONCEPTS

| Word in Title | Meaning using English Dictionary | Meaning according to academic articles |
|---|---|---|
| Impact | have a strong effect on someone or something | "The positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended" (Chianca, 2008, p. 43). |
| Technology | the application of scientific knowledge for practical purposes, especially in industry | "A system created by humans that uses knowledge and organization to produce objects and techniques for the attainment of specific goals" (Volti, 2009, p. 6) |
| Sustainable | the ability to be maintained at a certain rate or level. | "Securing the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland, 1987, p. 16) |
| Inclusion | the action or state of including or of being included within a group or structure. | "A philosophy where the belief is that everyone has a basic right to participate fully in society" (Peters, 1999, p. 15) |

## ABBREVIATIONS

| Acronym | Full description |
|---|---|
| ABSA | Amalgamated Banks of South Africa |
| AFI | Alliance for Financial Inclusion |
| ATM | Automated teller machine |
| CGAP | Consultative Group to Assist the Poor |
| FNB | First National Bank |
| ICASA | Independent Communication Authority of South Africa |
| IMF | International Monetary Fund |
| MTN | Mobile Telephone Network |
| OECD | Organization for Economic Co-operation and Development |
| SABRIC | South African Banking Risk Information Centre |
| SPSS | Statistical Package for Social Sciences |
| TAM | Technology acceptance model |
| TPB | Theory of planned behaviour |

# 1. INTRODUCTION TO THE RESEARCH

This research determines the perceived impact of fintech on financial inclusion in South Africa. Before getting to research conceptualisation in Section 1.2, the following section introduces the context and background of the study. First, the research conceptualisation Section 1.2 discusses the research problem statement Section 1.2.1, research purpose statement Section 1.2.2, research questions and research hypothesis Section 1.2.3. Next, section 1.3 discusses the delimitations and assumptions of the research study. Finally, section 1.4 discusses the significance of the research study, and the chapter closes with a preface of the research study in Section 1.5.

## 1.1 Context of and background to the study

Globally issues relating to financial inclusion, providing affordable financial products and services to all population segments have been a top priority for governments worldwide and different organisations (World Bank, 2014). Yet, more than 1.7 billion adults worldwide remain unbanked without a transaction account at a bank or a mobile money services provider (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2017).

In 2010 at the G20 Summit in Seoul, financial inclusion was recognised by G20 leaders as one of the critical pillars to increase economic growth, end poverty and inequality around the world (Timmermann 2017). Research has shown the positive impact of financial inclusion in increasing national economic growth, reducing income inequality, poverty alleviation and raising productivity growth (Barajas, Beck, Belhaj, & Naceur, 2020; Demirguc-Kunt, Klapper, & Singer, 2017). Access to formal financial systems allow people to make payments, remittances, savings, insurance, credit, wealth management efficiently and safely without fear of losing their money (Demirguc-Kunt, Klapper, & Singer, 2017).

The Global Financial Crisis of 2008 was the catalyst that saw the sudden rise of fintech companies worldwide. Fintech companies are "financial service

firms whose product or service is built upon technology, often resulting in highly innovative, pioneering services" (Gelis & Woods, 2014, p. 3). Governments can utilise these innovative technologies in the financial services industry to expand financial inclusion to previously excluded segments of the population by reducing the barriers to financial access in areas like mobile payments, remittances, credit access, insurance, savings etc (World Bank, 2014).

Since the advent of democracy in 1994, which saw the end of apartheid rule in South Africa, significant gains have been achieved in social equity and reduction of extreme poverty; however, the country still has challenges of poverty and inequality (Philip, Tsedu, & Zwane, 2014). South Africa is ranked one of the unequal countries in the world, with a highly polarised society where the gap between the rich and the poor is very high (World Bank, 2013). Furthermore, with over 55 million people (StatsSA, 2016), the country is still facing severe challenges addressing historical economic imbalances. Slow economic growth, high unemployment has hampered government efforts to reduce poverty and inequality (NationalTreasury, 2020).

The country boasts of a sophisticated, well-regulated, and well-developed financial sector with proper infrastructure; however, the biggest challenge has been the slow pace by the private sector to engage with low-income segments and tap into this market (National Treasury & AFI, 2014). In 2004 the government of South Africa, in partnership with four big private banks - FNB, Nedbank, ABSA, Standard Bank, working closely with Postbank, launched the Mzansi account, which was a low-cost entry-level transactional account (Kostov, Arun & Annim, 2015).

The Mzansi account initiative was a success in promoting the adoption of bank accounts and extending financial services to the previously excluded adults in South Africa; however, the usage of the bank accounts was shallow (National Treasury & AFI, 2014). In its draft financial inclusion policy framework, the National Treasury has identified the leveraging of fintech to promote and support financial inclusion in South Africa as one of its key priorities (National

Treasury, 2020). The main objective of this study is to determine the perceived impact of fintech on financial inclusion in the South African context.

## 1.2 Research conceptualisation

### 1.2.1 The research problem statement

South Africa is one of the world's most unequal countries, with a highly polarised society where the poor and the rich gap is very high (Dessus & Hanusch, 2018). The country's economy has a dual economy, with a well-developed high-end economy co-existing with a less developed low-end economy functioning in the townships, informal settlements, and rural areas (Bojabotseha, 2011).

Among the several strategies taken by the South African government to address the problems of poverty and inequality, financial inclusion through leveraging fintech has been identified as a critical enabler to deliver quality and affordable financial services to the previously disadvantage and under-served segments of the population (National Treasury, 2020). However, fintech has not been influential in South Africa, as evidenced by the failure of M-PESA launched by Vodacom SA in 2010 in partnership with Nedbank (Rouse & Verhoef, 2016). Despite this viewpoint, studies such as Kinsman (2019), Finscope (2017), Nyoka (2019) and Chigada and Hirshfelder (2017) have presented an opposite view that the use of technology has made progress towards increasing financial inclusion in South Africa. In addition, limited studies focused on the impact of fintech on financial inclusion in the South African context.

Given the above, the main problem is whether the implied financial inclusion in South Africa is associated with the adoption and usage of fintech on the ground. For example, the Mzansi account initiative managed to increase the adoption of transactional bank accounts but failed to address usage issues, propensity to save and sustainability (National Treasury & AFI, 2014).

An accompanying sub-problem of interest in this study is whether fintech influences the barriers to financial inclusion in the South African context. Some of the reasons why most South Africans are not using banks are high bank fees, mistrust of the formal financial sector in fear of exploitation, fraud, sense of trust with community groups like stokvels, too much documentation required by banks, and most people run their businesses informally (Kessler et al., 2017a)

Another sub-problem of interest is whether awareness of the benefits and risks associated with the use of fintech can influence the adoption and usage of online financial products and services in South Africa. The use of digital technology is creating benefits for consumers to engage with financial services; however, some risks come with using these technologies (National Treasury, 2020).

### 1.2.2 The research purpose statement

The primary purpose of this study is to determine the perceived impact of fintech on financial inclusion in South Africa.
The specific objectives of the study are:

- To determine if adoption and usage of fintech can influence financial inclusion.
- To determine if fintech can influence barriers to financial inclusion.
- To determine if awareness of benefits and risks associated with fintech influence the adoption and usage of fintech.

### 1.2.3 The research questions and research hypotheses

- Does fintech adoption and usage influence financial inclusion?

**$H_0$:** Fintech adoption and usage does not influence financial inclusion.
**$H_1$:** Fintech adoption and usage can influence financial inclusion.

- Does fintech influence barriers to financial inclusion?

**$H_0$:** Fintech does not influence barriers to financial inclusion.

**$H_1$:** Fintech can influence barriers to financial inclusion.

- Does awareness of benefits and risks associated with fintech influence adoption and usage?

**$H_0$:** Awareness of benefits and risks associated with fintech does not influence adoption and usage.

**$H_1$:** Awareness of benefits and risks associated with fintech influence adoption and usage.

## 1.3 Delimitations and assumptions of the research study

During the data collection process, the researcher assumed the respondents answered all the questionnaire questions truthfully. Unfortunately, due to the Covid-19 pandemic, time constraints and limited resources, data collection for this study was limited to adults living in South Africa who could read and write with access to an electronic device connected to the internet.

The researcher chose to focus on fintech ahead of other factors that can impact financial inclusion because this is a new trend. Due to technology, it is easier and quicker for people to adopt it than other factors mentioned below. Previous studies related to the use of technology and financial inclusion have focused more on the impact of mobile money on improving financial inclusion in developing economies and not fintech.

The study did not focus on other factors that impact financial inclusion like demographic factors, financial literacy, language barriers, religious beliefs, legal framework, and institutional factors like governance.

## 1.4 Significance of the research study

According to the World Bank (2018), financial inclusion is considered one of the key enablers to reduce poverty and inequality and boost developing economies like South Africa. South Africa is among the world's unequal countries, where the poor and the rich gap is very high (Dessus & Hanusch, 2018). Thus far, the South African government's measures to address these

issues have benefited only a few black elites and left the general population in extreme poverty (Ponte, Roberts, & Sittert, 2007). Therefore, the impact of fintech in promoting and supporting financial inclusion in the South African context is one of the key priorities in the recently drafted financial inclusion policy framework for South Africa by the National Treasury department (National Treasury, 2020).

This study aims to investigate the perceived impact of fintech on financial inclusion in South Africa. This study is essential to the government and the financial services sector as it addresses priority 16 in the draft financial inclusion policy framework by National Treasury, “Leveraging fintech disruptors to promote and support financial inclusion” (National Treasury, 2020, p. 4). Studying the impact of fintech on South Africa's financial inclusion is of great significance, provide insights into the country's battle to reduce poverty and inequality through financial inclusion. The study will also contribute to the already limited academic literature on the perceived impact of fintech on financial inclusion in the South African context.

## 1.5 Preface to the research report

To this end, the report has six chapters. Following this introductory chapter, Chapter 2 provides a literature review covering the research problem analysis, the previous studies, the explanatory framework, research knowledge gap analysis and the conceptual framework. Chapter 3 discusses the research strategy, design, procedures, reliability, validity measures, and limitations. Chapter 4 presents the research results, statistical analysis, reliability, and validity. Chapter 5 presents the research findings, and finally, Chapter 6 closes off the research report by presenting the research summary, conclusions, and recommendations for future studies.

# 2. LITERATURE REVIEW

This chapter has three broad objectives: understanding the research problem, identifying the knowledge gap, and developing a framework for interpreting the results and research findings. Specifically, in Section 2.1, we detail the research problem. Then, in Section 2.2, we review the literature on studies that have attempted similar research. Finally, with this knowledge, identify and describe a framework that we will use to interpret our research findings in Section 2.3.

## 2.1 Research problem analysis

South Africa is facing severe challenges in trying to addressing the post-independence challenges of high inequality and poverty. The country has about 2.9 million adults still excluded from the formal financial systems, still not fully utilising the financial access benefits (National Treasury, 2020). On the surface, the country looks inclusive, but the high adoption of transaction accounts is not matched by increased usage of the products and services (Kessler et al., 2017a).

In partnership with the private sector, the government of South Africa has made initiatives like the implementation of the Mzansi account to try and increase the country's financial inclusion. However, these initiatives have managed to increase the adoption of transactional bank accounts but failed to address usage issues, propensity to save and sustainability (National Treasury & AFI, 2014). In addition, lack of awareness and experience with technology are significant challenges that impact the adoption of digital services among low-income groups; technology can help reduce some financial inclusion barriers (Tobbin, 2012).

### 2.1.1 Definition of key terms

*Financial exclusion*

It is “a process whereby people encounter difficulties accessing and or using financial services and products in the mainstream market that are appropriate

to their needs and enable them to lead a normal social life in the society in which they belong" (Anderloni, Bayot, Błędowski, Iwanicz-Drozdowska, & Kempson, 2008, p. 9). Individuals can be financially excluded when they cannot access financial products and services at an affordable cost and appropriate way (Kodan & Chhikara, 2013).

*Financial inclusion*

"It refers to all initiatives that make formal financial services available, accessible, and affordable to all segments of the population. This requires particular attention to specific portions of the population that have been historically excluded from the formal financial sector either because of their income level and volatility, gender, location, type of activity, or level of financial literacy" (Triki & Faye, 2013, p. 25).

In the South African context, National Treasury defines financial inclusion as "the delivery of financial services at an affordable cost to vast sections of the population that are historically excluded or under-served by the formal financial sector" (National Treasury, 2020, p.1).

*Financial technology - fintech*

Financial technology provides or delivers financial and banking services using technological innovation driven by computer software and complex algorithms (Ozili, 2018).

### 2.1.2 Financial exclusion in detail

It's essential first to comprehend financial exclusion to understand financial inclusion fully (Abrahams, 2017). Financial exclusion can be categorised as voluntary self-exclusion; individuals who have access to financial services choose not to use them because there is no need, cultural or religious reasons (Cámara & Tuesta, 2014). The second category is involuntary exclusion, where barriers like physical distance, lack of proper infrastructure, low income, discrimination, high costs, the product does not meet the customer needs comes into play (Demirgüç-Kunt, Beck, & Honohan, 2008). Finally, most financially excluded individuals are the youth, elderly, illegal migrants, who

struggle with proper documentation, unemployed, and minorities (Bimha, 2015).

#### 2.1.2.1 Dimensions of financial exclusion

Many factors cause people to be financially excluded from using formal financial systems, as discussed below:

*Geographical exclusion* - Geographical location can impact access to financial services in many ways, and it can lead to the closure of bank branches in remote areas, poor infrastructure like roads and telecommunication systems which forces financial services to shun these isolated areas (Kempson, 2000; Kempson, Whyley, Caskey, & Collard, 2000). In addition, the lack of financial services in these remote areas deprives these communities of a chance of participation in the mainstream economy (Corr, 2006).

*Access exclusion* - Risk assessment by financial institutions might lead to financial exclusion as many people in low-income communities might not meet the standards required by these institutions to grant access to credit (Kempson et al., 2000).

*Condition exclusion* - Financial service providers sometimes can attach certain conditions to access their financial products, and these conditions might not be appropriate for the low-income consumer's needs (Kempson et al., 2000). In addition, the profit nature of these institutions forces them to create sophisticated products that are only suitable for their profitable customers (Corr, 2006).

*Price exclusion* - The bank charges or fees paid to maintain these financial products can be unaffordable for many people, leading to using traditional channels that are cheaper or at no cost (Kempson et al., 2000).

*Marketing exclusion* - Target marketing and sales strategies by financial service providers can lead to financial exclusion, and these institutions could

target only their high income or profitable customers. In addition, marketing exclusion can lead to information exclusion or blackout for low-income customers (Corr, 2006).

### 2.1.3 Financial inclusion in detail

#### 2.1.3.1 Measuring financial inclusion – dimensions.

Data is available from various sources for the supply-side and demand-side data to measure financial inclusion in a country or region. The supply-side information is available from multiple sources like CGAP, World Bank, African Development Bank, IMF. At the same time, Finscope, OECD, World Bank - Global Findex provide demand-side data (Triki & Faye, 2013).

To understand financial inclusion deeper, we need to look at it from a multi-dimensional perspective rather than looking at it from the included or not included view (Triki & Faye, 2013). Financial inclusion should not only be about the availability of financial services, but it should also consider if other financial systems dimensions are working appropriately to meet the supply and demand side, and it should be sustainable (Arcdic, Chen, & Latortue, 2012).

Various indicators determine the dimensions below from the demand side - consumers and supply-side - financial service providers (Cámara & Tuesta, 2014).

- Access - Availability of regulated financial service providers with little or no potential barriers like distance to the physical branches, automated teller machines and agent locations (Arcdic et al., 2012; Cámara & Tuesta, 2014).
- Usage – Usage of the available financial products and services, frequency and duration of use (Arcdic et al., 2012).
- Quality – Product-market fit, do the products address customers' needs and segmentation (Arcdic et al., 2012).
- Sustainability - The whole financial services ecosystem is beneficial to all stakeholders, and the consumers have access to affordable financial

products. At the same time, the financial service providers also profit from their products and services (Kessler et al., 2017).

When analysing data to get the extension of financial inclusion, it is vital to combine the data from all the dimensions because access does not imply usage, and usage does not mean the product or service meets the customer needs (Cámara & Tuesta, 2014).

#### 2.1.3.2 Barriers to financial inclusion

The barriers to financial inclusion vary from region to region, and these barriers are sometimes complex and interlinked (Abrahams, 2017). Lack of money, transaction costs, transport costs, physical distance to the nearest bank branch, and lack of proper documentation are the most common barriers among African adults (Zins & Weill, 2016). Globally lack of money is the most common barrier to financial inclusion for adults, and some self-reported barriers like distance to the nearest branch, high bank costs, lack of trust in the financial system and lack of proper documentation (Allen, Demirguc-Kunt, Klapper, & Peria, 2012; Zulfiqar, Chaudhary, & Aslam, 2016).

Financial inclusion barriers can be demand or supply barriers. The demand-side barriers are related to the customer perceptions that influence their choice of using the formal financial systems like financial service provider reliability, product design, product simplicity, transparency, fees, and distance to the nearest branch (Imaeva, Lobanova, & Tomilova, 2014). On the other hand, supply-side barriers include distance to the nearest branch, inappropriate and complex products, limited product range, policy regulation, lack of proper technology infrastructure (Bhuvana & Vasantha, 2016). In addition, for many financial service providers, high operating costs due to outdated technology, legacy business models and limited innovations make the processing of small transactions unprofitable, leading to the neglect of creating products that meet low-income consumers' needs (Pazarbasioglu et al., 2020a).

#### 2.1.3.3 Sustainable financial inclusion

Sustainable financial inclusion in an economy must address all facets of the financial ecosystem, the demand side - consumer needs, supply-side - financial service providers operating models, and the regulatory environment - public-private sector cooperation in creating a conducive environment for business (Kessler et al., 2017). Financial services providers do not create products and services that meet the needs of low-income segments because it is not profitable (Corr, 2006).

According to Kessler et al. (2017), when financial inclusion is sustainable in a country, it means the following:

- Transaction accounts - Bank fees are affordable to the consumer, and a bank's operating costs are compatible with those fees.
- Credit - Loan repayments are affordable to consumers, and the service providers' cost structure is compatible with the payments.
- Insurance - Consumers are paying affordable premiums, and insurance providers operating costs are compatible with the premiums.
- Savings - Savings must benefit the consumer, and the operating costs of the service provider are compatible with the interest rates.

### 2.1.4 Digital Financial Inclusion

Digital financial inclusion is providing formal financial services to low-income consumers, unbanked and the underbanked using digital technology channels (Duoguang et al., 2016). This process ensures that all economy members have easy access, availability, and usage of financial systems through digital technologies (Kesuh, Ngong, & Manasseh, 2020). In addition, digital innovations in the financial services industry have reduced access and costs barriers among the financially excluded population in various areas like digital payments and remittances, digital savings, digital wealth management, digital credit service, and digital insurance (Patwardhan, Singleton, & Schmitz 2018). Notable digital technology success stories worldwide include mobile money transfer M-PESA in Kenya, mobile banking in India, and peer-to-peer lending platforms in China (Arner, Buckley, & Zetzsche, 2018; Guild, 2017). According

to Zhang and Yang (2019), the integration of finance, innovation and digital technology has ushered in a new era of inclusive finance, which presents opportunities to promote economic growth and poverty alleviation in a sustainable way. In addition, the use of various technologies like the internet of things, big data, cloud computing, blockchain, and artificial intelligence can help reduce costs, increase efficiency, and optimise different operations in financial services (Zhang & Yang, 2019).

#### 2.1.4.1 Digital financial inclusion opportunities

Digital technologies can increase financial inclusion through the rapid growth in mobile payments, mobile banking and the use of biometric data, which can reduce costs, physical distance barriers and documentation barriers (Bimha, 2015). These technologies offer cost-effective, easy, convenient, and efficient ways for poor households and small businesses to save, access credit, insurance and make secure payments (Pearce, Michaels, Kachingwe, & Iravantchi, 2017). Digital technologies are transforming financial business models in payments, remittances, lending, insurance, wealth management and financial planning, all providing an opportunity to create cost-effective products that meet the needs of all segments of society (Pazarbasioglu et al., 2020).

The use of digital technologies can also help improve the government efficiency in the payment of grants or social benefits to the poor, which can also help to reduce crime, corruption (Shipalana, 2019). According to Pazarbasioglu et al. (2020), digital finance combined with technology can help financial service providers reduce cost, increase efficiency, security, optimisation, transparency, eliminate physical distance barriers and tailor products for the poor sustainably. It has been evident during the Covid-19 pandemic, where mobile money payments and online transactions have enabled individuals to transact with little or no physical contact (Pazarbasioglu et al., 2020).

#### 2.1.4.2 Digital financial inclusion risks and challenges

Despite all the benefits of digital finance, technology to improve financial inclusion comes with risks and challenges to the consumers and service providers. The use of digital finance poses data governance and privacy protection challenges, cybersecurity challenges, financial integrity challenges, and fair competition issues where big companies can monopolise the industry (Pazarbasioglu et al., 2020). According to Shipalana (2019), service providers can use unethical practices to increase profits and lure unsuspecting customers, and heavy regulation can impact investment in the industry which can reduce competition. This can severely impact both consumers and the service providers, and consumers will lose trust in the system and digital technology, leading to further exclusion (Shipalana, 2019).

The profit nature of corporations can lead to further exclusion through marketing exclusion and withdrawal of services to remote geographical areas like rural areas with poor infrastructure (Ozili, 2018). Other challenges might include consumer over-indebtedness through digital credit, data security and confidentiality issues, discrimination via digital credit scoring, and those will literacy issues will be excluded (Pazarbasioglu et al., 2020).

### 2.1.5 Consequences of poor financial inclusion

Poor financial inclusion can lead to financial, social, and economic repercussions. Financially excluded individuals might suffer from over-indebtedness (Gloukoviezoff, 2007; Russell, Maître, & Donnelly, 2011), social exclusion and mental health issues (Hajaj, 2002). Financially excluded individuals have difficulties finding employment, accessing credit, meeting some of the financial commitments that might need services of financial services providers like paying for electricity bills and rentals. They end up resorting to risk and expensive channels like cash payments or accessing credit via informal systems with high interests rates (Kodan & Chhikara, 2013; Smyczek & Matysiewicz, 2014).

## 2.2 Research knowledge gap analysis

First, evidence from China includes Huang, Wang, and Wang (2020) investigated the impact of mobile payments on China's financial inclusion. The study used a sample of 15926 household observations, and their findings suggest that the use of mobile money payments systems improves risk-sharing among the consumers, increases small and medium business or entrepreneurship opportunities, and has a positive impact on financial inclusion (Huang, Wang, & Wang, 2020).

Second, in terms of evidence from India, Nandhi (2012) conducted a study to explore how mobile banking affects the savings behaviour of low-income consumers in Dehli, India. The study revealed four key findings. First mobile banking helped the customers to save compared to the traditional way of keeping their money in cash. Second, customers found saving through mobile banking to be effective, simple, secure, and trustworthy and dependency on risky saving methods reduced drastically among the customers. Third, customers found mobile banking to be a viable substitute to traditional banking and informal ways of savings. Fourth, customers were now using mobile banking in conjunction with the other saving practices (Nandhi, 2012). These results agree with Kozma (2016) analysing mobile money's impact on financial inclusion in Sub-Saharan Africa (Kozma, 2016). Suri and Jack (2011) also found similar results that mobile money is not a competitor but a complimentary service for making savings for M-PESA customers in Kenya (Jack & Suri, 2011).

Third, evidence from Africa excluding the SADC region include Wakaba and Wepukhulu (2019), who conducted a study to find the effect of mobile money on Kenya's financial inclusion. The quantitative research study used secondary data between 2013 and 2018 collected from a sample of 4 telecoms companies in Kenya. The study showed a positive and significant relationship between Kenya's financial inclusion and the use of mobile money for deposits, savings, payment of bills and agency banking (Wakaba & Wepukhulu, 2019). Findings from this study concurred with studies like Vong, Fang and Insu

(2012) on mobile deposits, who noted that the high number of mobile deposits indicates financial inclusion (Vong, Fang, & Insu, 2012). Furthermore, Ouma, Odongo and Were (2017), on the issue of savings, noted that when unbanked and underserved have access to mobile savings service, it increases financial inclusion (Ouma, Odongo, & Were 2017). In addition, Kya, Rugemintwari and Sauviat (2017) showed that mobile money encouraged a saving culture among the low-income groups (Kya, Rugemintwari, & Sauviat, 2017).

Fourth, evidence from the SADC region excluding South Africa. Mutsonziwa and Maposa (2016) investigated mobile money in a developing country using Zimbabwe as a case study. The study used credible and reliable Finscope national survey data collected in Zimbabwe in 2011 and 2014, with a sample size of 4000 adults each year. The study found that mobile money was popular among the adult population, with more than 45% using it, over 65% saying it's convenient, and 36% saying it's affordable (Mutsonziwa & Maposa, 2016). Mago and Chitokwindo (2014) conducted a qualitative research study in Zimbabwe to investigate the impact of mobile banking on financial inclusion in the country. Using data collected through a descriptive survey from four districts in Masvingo province, the study used a sample size of 270 respondents. The results showed that low-income households previously excluded from the financial system have accepted and adopted mobile banking because they find it easily accessible, convenient, cheaper, easy to use and secure to send and receive money (Mago & Chitokwindo, 2014).

Fifth, in South Africa, Kinsman (2019) examined the underbanked consumers' perceptions and intentions on card-less banking in Nelson Mandela Metropolitan. The quantitative research study used a sample of 175 respondents of underbanked consumers in the province who reside in townships. The results revealed if card-less banking is simpler to use and less complex, more unbanked consumers would be willing to adopt it. These results show that underbanked consumers can embrace technology for their day to day transactions as long as it's easily accessible, cheaper, simpler and convenient to them (Kinsman, 2019).

### 2.2.1 Existing knowledge gaps

The studies discussed above all agree that mobile money has a positive impact on financial inclusion. However, there is a gap in the literature, especially for research studies that looked at other technologies other than mobile money for financial inclusion like fintech in the South African context. For example, Dragoş (2017) looked at how blockchain technology impacts financial inclusion in the United States. Danho (2019) investigated the perceived usefulness of blockchain technology on mobile money services in Sub-Saharan Africa. Yermack (2018) looked at fintech products that have succeeded and failed in Africa. However, literature on the impact of fintech on financial inclusion in South Africa is very scarce. Studies that have attempted to investigate the effect of technology on financial inclusion in South Africa include Kinsman (2019). He examined the impact of card-less banking on financial inclusion in Nelson Mandela province. Abrahams (2017) reviewed financial inclusion in South Africa looked at technologies that have succeeded in the country. This research study intends to narrow this gap by investigating the perceived impact of fintech on financial inclusion in the context of South Africa.

## 2.3 Framework for interpreting research findings

This section looks at the theories and models for interpreting the research findings. Theories and models play a critical role in research as they provide frameworks for designing and interpreting the results in research studies (Kim & Crowston, 2011).

### 2.3.1 Technology acceptance model - TAM

Davis (1989) developed the technology acceptance model, influenced by reasoned action theory and reasoned behaviour theory (Kim & Crowston, 2011). TAM is used to forecast how an organisation will adopt new technology (Aiolfi & Bellini, 2019). In addition, Davis (1989) added two new constructs, “perceived usefulness and perceived ease of use” (p.320). Davis (1989) defined the two constructs as follows:

- Perceived usefulness – “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p. 320)
- Perceived ease of use – “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320)

Davis (1989) claimed if a user believed the system was beneficial to their performance at work and easier to use, they are more likely to adopt and accept it.

Figure 2.1 depicts the technology acceptance model.

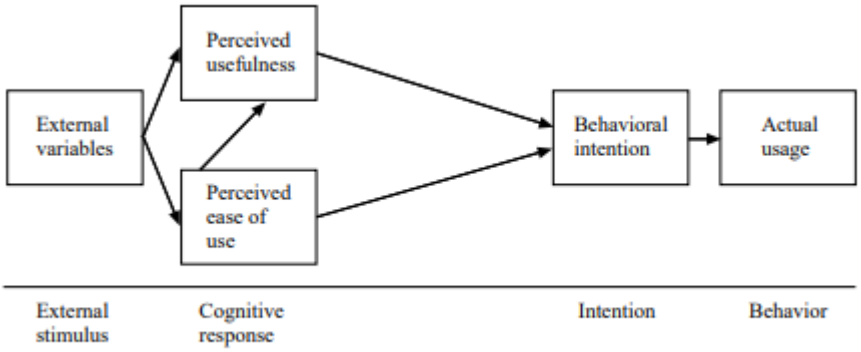



FIGURE 1. Technology acceptance model (TAM).

**Figure 2.1: Technology acceptance model**

Source: (Davis & Venkatesh, 1996, p. 20)

The technology acceptance model has utilised in several studies. It was first used at IBM in Canada to test the adoption of email service, and a file editor and the findings on perceived usefulness validated the model (Sharma & Mishra, 2014). In addition, King and He (2006) found it to be a “valid and robust” model that can be beneficial in many areas (King & He, 2006). However, many researchers have criticised the technology acceptance model for being constantly modified, and it's not easy to understand which version is acceptable considering the fast-changing technology environment (Benbasat & Barki, 2007; Otieno, Liyala, Odongo, & Abeka, 2016). It has also been criticised for being suited to be used only in an organisational setting and not in other everyday settings (Lule, Omwansa, & Waema, 2012; Venkatesh & Davis, 2000).

### 2.3.2 Technology acceptance model 2 – TAM2

Technology acceptance model 2 (TAM2) is an extension of the original technology acceptance model. According to Venkatesh and Davis (2000), "TAM2 incorporates additional theoretical constructs spanning social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use)" (Venkatesh & Davis, 2000, p. 187).

Figure 2.2 depicts the technology acceptance model 2.

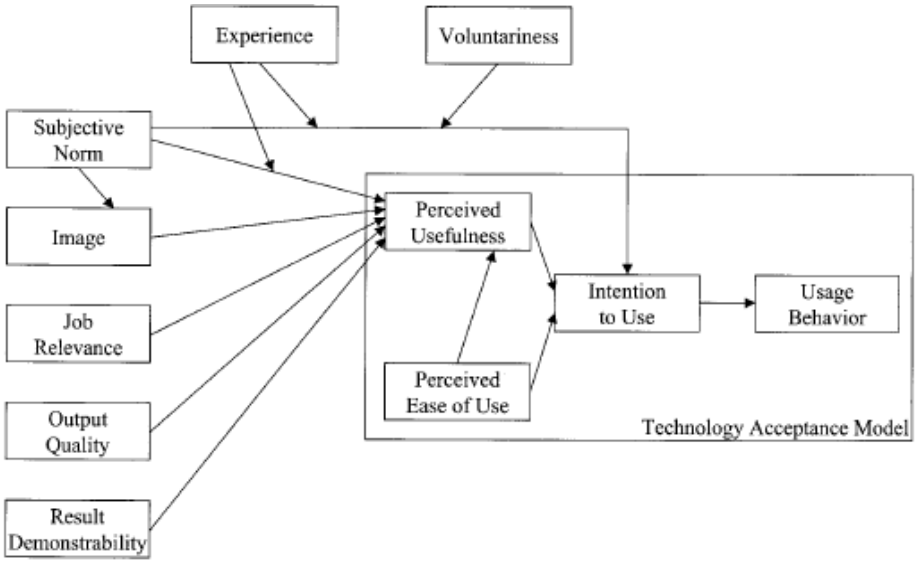



**Figure 2.2: Technology acceptance model 2**

Source: (Venkatesh & Davis, 2000, p. 188).

When consumers perceive advantages and serviceability when using fintech, they are more likely to adopt and use these products and services. Additionally, when fintech products and services are easier to understand and use, consumers will be more inclined to adopt and use these products and services.

The technology acceptance models - TAM and TAM2 will help this study make sense of the observations and results. The constructs "perceived usefulness" and "perceived ease of use" will help us understand how they influence "behavioural intention" to adopt and use fintech products and services. The

model will be used to hypothesise the correlation or linear relationship between the dependant and independent variables (Pigott, 2017).

### 2.3.3 Diffusion of innovation theory

Rogers (1995) defined diffusion as the process of communicating an innovation over a certain period among the population, where innovation can be an idea or behaviour the people perceive as new. The theory focuses on reinventing the product or idea to meet the people's needs than persuading the people to adopt the change (Robinson, 2009). According to Rogers (1995), the adoption rate is the speed of adoption or the number of people who adopt the innovation over a specified period. The following variables determine the rate of adoption:

- Relative advantage – the degree to which the new idea, technology or behaviour is perceived as better than its predecessor by the audience regarding its performance, convenience, cost, or risk. The audience should view it as advantageous (Rogers, 1995).
- Compatibility – The degree to which the new idea or innovation is consistent with the current norms, previous experiences, and the audience's needs (Rogers, 1995).
- Complexity – The level of difficulty to use or understand the innovation (Rogers, 1995).
- Trialability – the extent to which the new idea or innovation can be experimented with (Rogers, 1995).
- Observability – the extent to which the audience can see the new idea or innovation (Rogers, 1995).

“Innovations that are perceived by individuals as having a greater relative advantage, compatibility, trialability, observability, and less complexity will be adopted more rapidly than other innovations” (Rogers, 2002, p. 990). Figure 2.3 depicts the diffusion of innovation theory.

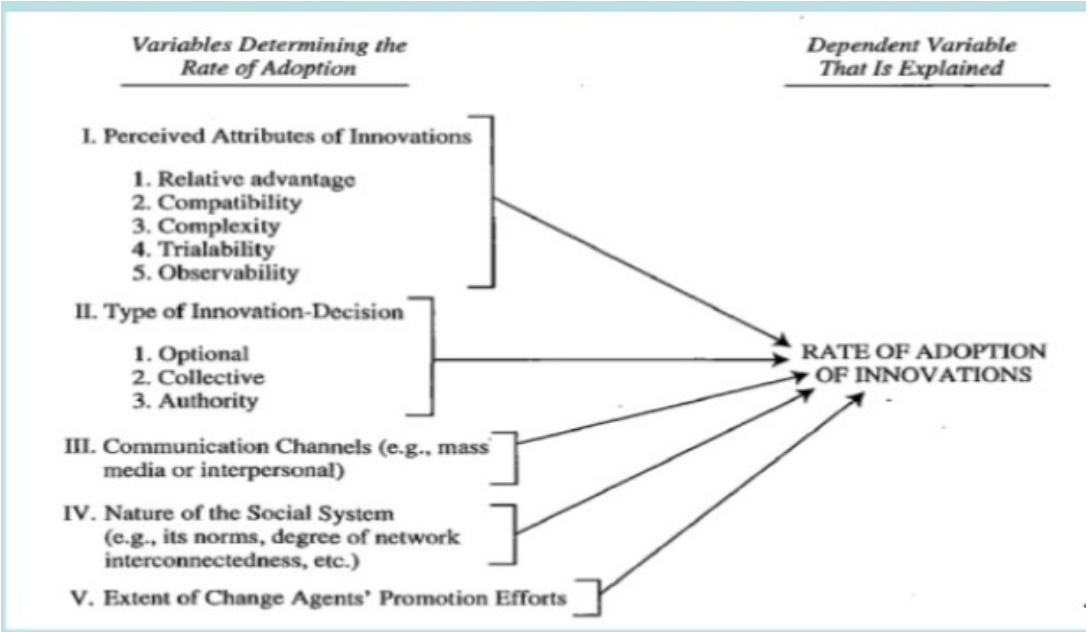



**Figure 2.3: Diffusion of innovation theory**

Source: (Rogers, 1995, p. 207).

The diffusion of innovation constructs "relative advantage, compatibility, trialability and observability" will help understand how they influence users' perceptions to adopt and use fintech products and services.

### 2.3.4 Integrated TAM and TPB with "*perceived risk and perceived benefit*."

The model was developed by Lee (2009) after integrating the technology acceptance model and the theory of planned behaviour with the perceived risk theory in a mobile banking adoption study. The perceived risk theory is always used to explain consumer behaviour. Perceived risk has the following dimensions:

- Performance risk – the potential loss due to the product not working as designed or advertised, hence failing to deliver the promised benefits (Lee, 2009).
- Social risk – potential loss or diminished social standing results from adopting the product or service (Lee, 2009).
- Financial risk – potential money lost after buying the product or transactional errors (Lee, 2009).

- Security risk – potential loss due to security breach on the system, fraud or hacking leading to loss of personal information (Lee, 2009).
- Convenience/time risk – potential time lost learning or using the system only for the product failing to perform as expected (Lee, 2009).
- Physical risk – potential harm resulting from purchasing the product.

Perceived benefit – According to Lee (2009), the perceived benefits can be direct or indirect advantages. Direct advantages are tangible benefits that users get from using the system like improved performance, increased security, lower transaction fees, automation of tasks etc. Indirect advantages are the benefits that are intangible and not easy to measure, like convenience (Lee, 2009). Figure 2.4 depicts the integrated TAM and TPB model.

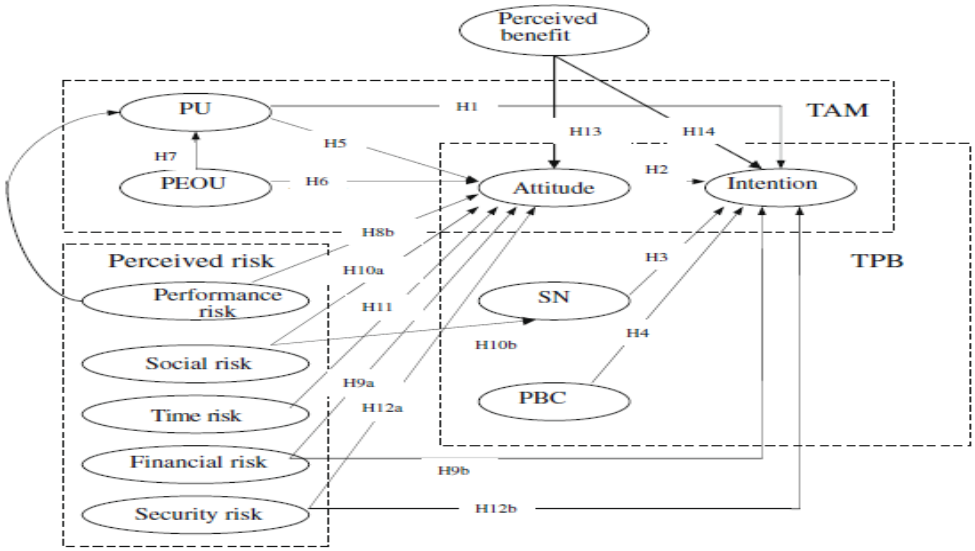



**Figure 2.4: Integrated TAM and TPB model with perceived risk and benefit**

Source: (Lee, 2009, p. 133)

Studies that have utilised the perceived risk construct in technology adoption studies include (Masinge, 2010; Tan & Teo, 2000; Wu & Wang, 2005).

### 2.3.5 Integrated TAM2 with perceived cost, perceived risk, and trust

Masinge (2010) proposed a new model that used original TAM2 constructs of perceived usefulness and perceived ease of use, combined with the five

characteristics of perceived risk, and added two more constructs, perceived cost, and trust. Figure 2.5 depicts the integrated model.

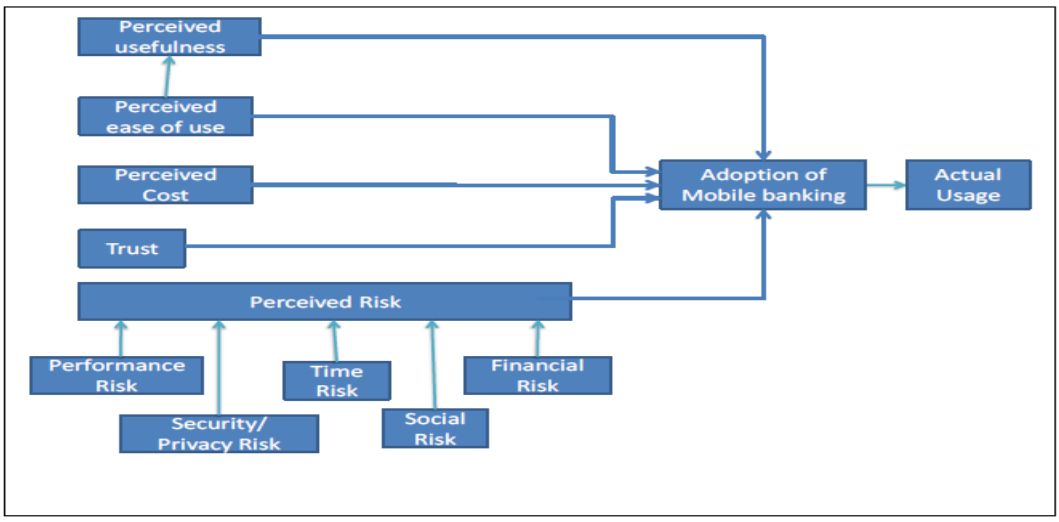



**Figure 2.5: Integrated TAM2 with perceived cost, perceived risk, and trust**

Source: (Masinge, 2010, p. 27)

Perceived cost – defined as the degree to which a user believes using a system will cost them money, including fees, transaction costs, mobile data costs, and device costs (Masinge, 2010).

The more consumers understand the perceived benefits and risks associated with the use of fintech products and services, the more likely they are to make an informed decision to adopt and use them. Furthermore, when the perceived benefits and perceived costs outweigh the perceived risks, they will be more inclined to use and adopt fintech products and services.

The constructs perceived risk, perceived benefit, perceived cost discussed in the integrated model above in Section 2.3.4 and Section 2.3.5 would help us understand how they influence users' behavioural intention to adopt and use fintech products and services.

## 2.4 Conclusion

A literature review was presented in this chapter which examined three general objectives for understanding the research problem, identifying the knowledge gap, and developing an interpretation framework for the research results and findings.

The literature has shown that barriers to financial inclusion vary from region to region, and these barriers can be complex and interrelated (Abrahams, 2017). Lack of money, geographical distance to the nearest bank branch, lack of proper documentation, high transaction and transport costs, and lack of trust in the financial systems are some of the barriers to financial inclusion (Allen, Demirguc-Kunt, Klapper, & Peria, 2012; Zulfiqar, Chaudhary, & Aslam, 2016). According to literature, leveraging financial technologies in the areas of payments, remittances, lending, insurance, wealth management, etc. can be helpful for financial inclusion and reduce the barriers to financial inclusion (Bimha, 2015). Despite the opportunities, financial technologies come with risks and challenges for both consumers and service providers, such as data governance and privacy protection, cybersecurity, fraud, etc. (Pazarbasioglu et al., 2020). Research studies on financial technology and financial inclusion are important as they can provide strategy recommendations and policies that will help improve financial inclusion in the country for the government, financial institutions, and other organizations.

Literature also indicates that not many studies have been conducted on fintech and financial inclusion in South Africa, and those that have been conducted have mainly dealt with mobile banking and mobile money.

Literature on the technology acceptance model (TAM) has demonstrated that perceived usefulness and perceived ease of use are the two main constructs that determine intentions to adopt and use technology. TAM has been further extended by authors by adding other constructs such as perceived risk, perceived benefit, and trust. The constructs are important to help us

understand how they influence users' behavioural intentions to adopt and use technology.

# 3. RESEARCH STRATEGY, DESIGN, PROCEDURE AND METHODS

Chapter 2 reviewed the literature and presented frameworks used to interpret and discuss the research questions results and findings. The three research questions posed in Section 1.2.3 are: 'Does fintech adoption and usage influence financial inclusion?', 'Does fintech influence barriers to financial inclusion?', and 'Does awareness of benefits and risks associated with fintech influence adoption and usage?'. Chapter 3 discusses the research strategy in Section 3.1; research design in Section 3.2; research procedure and methods in Section 3.3; research strengthens – reliability and validity in Section 3.4 and research weakness – administrative and technical limitations in Section 3.5.

## 3.1 Research strategy

Research strategy or research paradigm or research approach is the general orientation, method, or plan to conduct research (Bryman, 2012). It involves breaking down the problem into sub-problems and evaluating each sub-problem against the data (Neuman, 2014). Research strategies can be qualitative, quantitative, or mixed methods (Bryman, 2012).

Looking at the research questions, literature review, framework for interpreting research findings and strategies used in similar research studies, this study will utilise a quantitative research strategy. Quantitative research strategy emphasises quantification or numerical data collection and analysis (Bryman, 2012), and it's "characterised by deductive approaches to the research process aimed at proving, disproving, or lending credence to existing theories" (Leavy, 2017, p. 9).

Wakaba and Wepukhulu (2019) in Kenya and Kinsman (2019) in South Africa applied a quantitative research strategy. Using a quantitative research strategy has several benefits. First, quantitative data analysis saves time because the study can use software like SPSS (Eyisi, 2016). Second, scientific methods to collect and analyse data generalise the results possible (Queirós, Faria, & Almeida, 2017). Third, the researcher can perform correlation,

regression, multivariate analysis and other statistical tests on the data. (Queirós et al., 2017). Fourth, hypothesis testing means the researcher does not need to make intelligent decisions or guesswork because of clear guidelines and set objectives (Eyisi, 2016). Lastly, surveys for data collection in quantitative research studies eliminate researcher bias and subjectivity (Queirós et al., 2017).

Using a quantitative research strategy in this study simplified data collection, processing, interpreting, analysis, and it was cost-effective.

## 3.2 Research Design

Research designs provide a foundation, structure, or framework for collecting, interpreting, and analysing data (Bryman, 2012). They are procedures of inquiry found in qualitative, quantitative and mixed methods strategies that guide a research study (Creswell & Creswell, 2018). These five types of research designs are: “experimental design, cross-sectional or survey design, longitudinal design, case study design and comparative design” (Bryman, 2012, p. 50).

This study utilised a cross-sectional or survey design. The cross-sectional research design involves collecting quantitative data from more than one case to establish variation among the variables. The researcher can also collect data at a single point in time (Bryman, 2012).

Abor, Amidu and Issahaku (2018) also used a cross-sectional design. The benefits of using a cross-sectional design are that the researcher can collect data from different places quickly (Johnson & Christensen, 2014). It is simple, cheaper, and the researcher can use collected data for other research types (Neuman, 2014). Using a cross-sectional design enables the researcher to examine relationships between variables, and the researcher can use it for descriptive analysis (Bryman, 2012).

## 3.3 Research procedure and methods

### 3.3.1 Research data and information collection instrument(s)

Data collection is one of the most critical components of a research project. A researcher needs to decide when choosing the data collection instruments and the type of data collected. Data can be managed using different data collection instruments like a structured interview schedule or self-completion questionnaire and observation schedule (Bryman, 2012).

This study utilised a fully structured interview schedule or self-completion questionnaire, which was sent online to all respondents to complete independently. According to Johnson and Christensen (2014), in a self-completion questionnaire, no interviewer is involved; the participants must read and answer the questions alone. Therefore, the questionnaire should have more closed questions and few open-ended questions, questions should be easy to follow and answer, and the questions should be short and precise to avoid boring the respondent.

Kinsman (2019) in South Africa used a self-completion questionnaire in a related study. A self-completion questionnaire has the following benefits. First, a self-completion questionnaire is cheaper and quicker to administer; it can be sent via post or completed online. (Bryman, 2012; Neuman, 2014). Second, using a self-completion questionnaire eliminates interview effects and interviewer variability when asking questions because no interviewer is present when respondents complete the questionnaire (Bryman, 2012). Lastly, respondents can complete the questionnaire during their own free time at their speed, bringing many conveniences (Bryman, 2012; Neuman, 2014).

### 3.3.2 Research target population and selection of respondents

#### 3.3.2.1 Target population

A target population is a large group or set of all elements which the researcher wants to learn about or generalise for his / her sample (Johnson & Christensen, 2014). Neuman (2014) described it as “the concretely specified large group of many cases from which a researcher draws a sample, and to which results

from the sample are generalised" (p.252). The target population for this study were adults above the age of 18 who reside in South Africa with an electronic device that can access the internet.

#### 3.3.2.2 Sampling or selection of respondents from the target population

A sample is a subset or segment of the population that the researcher will select for the study (Bryman, 2012). Neuman (2014) described a sample as a subset or part of cases selected from a large pool by the researcher, and it is generalised to the population. Probability and non-probability sampling are two of the most popular research studies sampling techniques (Bryman, 2012).

Due to time constraints, a non-probability sampling technique was used in this research study. The researcher used the convenience sampling method because of its simplicity and accessibility to the sample. Convenience sampling means collecting data from participants conveniently available to the researcher to participate in the study (Bryman, 2012). The researcher sent the online questionnaire link to the respondents via different online communication channels like WhatsApp, Telegram, email, LinkedIn, and Facebook.

### 3.3.3 Ethical considerations when collecting research data.

According to Leavy (2017), "ethics involves morality, integrity, fairness, and truthfulness" (p.24). The principles and morals guide our behaviour and help us uphold things we value (Johnson & Christensen, 2014).

For this study, the researcher followed the following ethical considerations. The safety and security of the respondents were of paramount importance to ensure no harm to the participants. The researcher sent out an informed consent letter to all respondents, letting them know that their participation was voluntary; they were free to withdraw their participation in the study at any time with no ramifications. The researcher assured respondents of anonymity and that all the information they provided was strictly private and confidential. The

data collected was only for academic purposes, and the study results would be made available upon request. All data collected was stored in a password-protected database application. The researcher always kept all information extracted from the database in a password-protected word processor. A full informed consent letter sent to all respondents is attached see Appendix 1.1.

### 3.3.4 Research data collection procedure

Data collection is one of the essential steps for any research, and it involves collecting data from the respondents for analysis to answer the research questions (Bryman, 2012). Data for the research study is collected using online surveys, online self-completion questionnaires, and interviews (Johnson & Christensen, 2014).

This study collected data using an online self-completion questionnaire created on the Survey Monkey platform. The researcher shared the online link with the respondents via different online communication channels like WhatsApp, Telegram, email, and social media platforms like LinkedIn. Responses collected from the respondents were only accessible to the researcher who had the username and password to access the Survey Monkey database. The researcher exported raw data from the Survey Monkey database to a password protected excel sheet and prepared it for processing.

### 3.3.5 Research data processing and analysis

#### 3.3.5.1 Research data processing

Once the data is collected, it needs processing for analysis. Data processing involves “editing, coding, classification and tabulation of collected data so that they are amenable to analysis” (Kothari, 2004, p. 122). Data coding involves re-organising raw data systematically for easy analysis with statistical software packages and data cleaning, looking for blank responses and assigning a value to them (Neuman, 2014).

Data was collected using an online self-completion questionnaire created on the Survey Monkey platform, and the data was captured and automatically

coded through the platform. The researcher could export survey data from the platform in various formats such as excel, pdf, CSV, and SPSS ready format. By default, data exported to SPSS format from the Survey Monkey platform was already assigned with numeric codes for each response, eliminating the need to do manual coding. Most of the survey questions were closed-ended, and the numeric codes posted by Survey Monkey were already sufficient. Only question 9 ('Please indicate which online financial products and services do you use the most?') required coding because it involved entering multiple responses.

The researcher performed data cleaning to remove or modify incorrectly captured data, missing values or not correctly formatted. The researcher conducted data cleaning in three steps:

- Missing value analysis - In SPSS descriptive statistics, the researcher ran frequency tests to identify variables with missing values; the researcher found no missing values.
- Out of the range value analysis – In SPSS descriptive statistics, frequency tests were also run to identity the minimum and maximum values for each variable. There were no out of range values because Survey Monkey assigned the appropriate codes for each response during data collection.
- Detecting and removing outliers – In SPSS descriptive statistics, the researcher explored all variables to identify any outliers; there were no outliers in the data collected.

#### 3.3.5.2 Research data analysis

Data analysis is “the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect” (Babbie, 2010, p. 422). A researcher can use various methods to analyse data in quantitative research like correlation analysis, regression analysis, cluster analysis, content analysis (Babbie, 2010; Johnson & Christensen, 2014).

This study analysed data using Statistical Package for Social Sciences (SPSS) Version 27. The researcher used descriptive statistics to describe and summarise the data, which included frequencies and bar graphs. Statistical inference tests done in this study included statistical significance tests, correlation analysis. Data were also analysed using regression analysis. Regression analysis is a set of statistical methods used to explain or estimate the relationship between a single dependent variable based on the value(s) of one or more independent variables (Leavy, 2017). The benefit of using regression analysis is the flexibility to adjust for control variables simultaneously and the ability to determine the impact of one or more independent variables on the dependent variable (Neuman, 2014).

The following linear regression models were used to test each hypothesis:

**Objective 1**: To determine if the adoption and usage of fintech can influence financial inclusion.

This study considers a multivariate linear model of the form:

$$FI_i = \alpha_i + \beta FT_{usage} + \beta FT_{adoption} + \varepsilon_i \quad (2)$$

Where:

$FI$ - shows a financial inclusion variable, measured by the financial access to transactional bank accounts, credit, insurance, and savings by all population segments.

$FT_{usage}$– shows a fintech variable, measured by the individuals who frequently use technology for their day-to-day transactions than visiting a brick 'n' mortar branch.

$FT_{adoption}$ -- shows a fintech variable, measured by individuals who have access and have adopted technology for their day-to-day transactions – transactional banking, credit, insurance, and savings.

$\beta$ – coefficient of interest that measure the effect of $FT_{usage}$ *or* $FT_{adoption}$ *on FI*

$\alpha$ – is the constant parameter

$\varepsilon$ – is the error term

**Objective 2**: To determine if fintech influence the barriers to financial inclusion.

This study considers a univariate linear model of the form:

$$FI_{_barriersi} = \alpha_i + \beta FT_i + \varepsilon_i \quad (1)$$

Where:

$FI_barriers$ - shows a financial inclusion barrier variable, which includes:

geographical distance to the nearest branch – respondents who agree or disagree that fintech reduces the distance barrier.

Transport costs to the nearest bank branch – respondents who agree or disagree that fintech reduces the transport costs barrier.

Transaction costs or fees – respondents who agree or disagree that fintech reduces the transaction costs barrier.

Lack of proper documentation – respondents who agree or disagree that fintech lowers the documentation barrier.

$FT$ – shows a fintech variable, measured by the usage of online financial products and services for transaction accounts, credit, insurance, and savings

$\beta$ – coefficient of interest that measure the effect of *FT on* $FI_{_barriers}$

$\alpha$ – is the constant parameter

$\varepsilon$ – is the error term

**Objective 3**: To determine if awareness of benefits and risks associated with fintech influence adoption and usage.

This study considers a multivariate linear model of the form:

$$FT_{adoption} = \alpha_i + \beta Benefits\ awareness_i + \beta Risk\ awareness + \varepsilon_i \quad (3a)$$

$$FT_{usage} = \alpha_i + \beta Benefits\ awareness \quad + \beta Risk\ awareness + \varepsilon_i \quad (3b)$$

Where:

$FT_{usage}$– shows a fintech variable, measured by the individuals who frequently use technology for their day-to-day transactions than visiting a brick 'n' mortar branch.

$FT_{adoption}$ -- shows a fintech variable, measured by individuals who have access and adopted technology for their day-to-day transactions – transactional banking, credit, insurance, and savings.

$Benefits\ awareness$ – shows a benefits awareness variable, measured by the individuals who are aware of benefits associated with fintech before adoption or usage.

$Risk\ awareness$ – shows a risk awareness variable, measured by individuals aware of risks associated with fintech before adoption or usage.

$\beta$ – coefficient of interest that measure the effect benefits and risk awareness on $FT_{usage}$ and $FT_{adoption}$

$\alpha$ – is the constant parameter

$\varepsilon$ – is the error term

#### 3.3.5.3 Description of the respondents

The respondents to be used for this study were adults above 18 who are resident in South Africa. Since the data collection was through an online survey, the respondents needed to have an electronic device with access to the internet and read and write. The use of an online questionnaire made it possible to reach people in all provinces in South Africa.

## 3.4 Research strengthens – reliability and validity measures applied.

Reliability is “the dependability or consistency of the measure of a variable” (Neuman, 2014, p. 212). If we apply the same technique on the same object several times, we should always get the same result (Babbie, 2010). A measure is reliable when it is always stable over time with no fluctuations. In addition, it should have internal reliability, which means scale or index indicators should remain consistent, and inter-observer consistency - in a case where subjective judgement is involved, all observer decisions need to stay the same (Bryman,2012).

Validity is “the issue of whether an indicator (or set of indicators) that is devised to gauge a concept measures that concept” (Bryman,2012, p.171). Its more to do with truthfulness, how close an idea is to actual reality (Neuman, 2014), the integrity of research findings or conclusion (Bryman, 2012).

In quantitative research, the researcher can measure validity in four ways which are: -

- Measurement validity – a device should measure what it claims to measure, and its results should be consistent; the measure should always reflect the concept it measures (Bryman, 2012).
- Internal validity – the research design has no internal errors that might lead to false findings or conclusions (Neuman, 2014).
- External validity – degree or how far can we generalise the findings across the population (Bryman, 2012)
- Ecological validity – the findings or results can be generalised to the real-world setting (Leavy, 2017).

Reliability and validity are essential in research because they help us establish how truthful, credible, and believable our research findings are, increasing our confidence in our results (Neuman, 2014).

Face validity was conducted by sending the questionnaire to the supervisor to check for any repeated, confusing, and leading questions. The researcher then performed a pilot survey with a few selected respondents to ensure he had captured all the questions correctly with no errors. The researcher used the feedback from the respondents to ensure the questionnaire was correct before the actual survey. However, the researcher did not include results from this pilot survey in the final study. The researcher also used Cronbach's alpha to test for internal reliability because it's versatile and tested in many situations (Johnson & Christensen, 2014). A Cronbach's alpha value greater than 0.6 was considered acceptable for internal reliability.

### 3.5 Research weaknesses – technical and administrative limitations

The study faced many challenges; data collection from low-income segments was a challenge as most of these respondents did not have electronic devices with access to the internet. In some cases, some of the respondents did not respond to the request to complete the questionnaire. In addition, since this was an online survey, it was impossible to capture the emotions and behaviour of the respondents, and the reliability of data was dependent on the quality of responses (Choy, 2014).

Time constraints for the data collection and presentation of findings and the final report also challenged the researcher to collect data using a non-probability sampling technique - convenience sampling, and 125 respondents participated in the study.

## 3.6 Conclusion

This chapter presented the research strategy, design, procedure and methods. A quantitative research strategy and a cross-sectional or survey design were used to collect data from the participants. Non-probability sampling using the convenience sampling method was used to collect data, where an online questionnaire link was sent to the respondents via different online communication channels like Whatsapp, email, social media platforms etc. Data were processed and analyzed using SPSS. Ethical considerations, research strengths (reliability and validity measures), weaknesses (technical and administrative limitations) have been highlighted.

# 4. PRESENTATION OF RESEARCH RESULTS

Chapter 3 presented the research strategy, research design, research procedure and methods, research data and information collection processing and analysis, research strengthens (reliability and validity) and research weaknesses (technical and administrative limitations). This chapter presents the research results by making use of bar graphs and statistical tables. Section 4.1 presents reliability and validity tests. Section 4.2 presents the descriptive statistics for the demographic information. Section 4.3 presents results for the first research question- 'Does fintech adoption and usage influence financial inclusion?'. Section 4.4 presents results for the second research question- 'Does fintech influence barriers to financial inclusion, and Section 4.5 present results for the third research question- 'Does awareness of benefits and risks associated with fintech influence adoption and usage?'. The researcher will use the words *"online financial products and services"* interchangeably with *"fintech" in this study.*

## 4.1 Reliability and Validity

The data collection instrument was tested for internal consistency and construct reliability. Cronbach's alpha (α) coefficient test internal consistency. The questionnaire consisted of 18 items related to the research questions and nine demographic questions. The researcher used a 5-point Likert scale ranging from 1-5 (1=Strongly Agree, 2=Agree, 3=Neither agree nor disagree, 4=Disagree, 5=Strongly disagree) to collect responses for the research questions. After running reliability checks, the researcher deleted two items to improve the internal consistency of the data collection instrument. A Cronbach's alpha (α) coefficient greater than 0.6 was considered acceptable. Research questions items tested for internal consistency. The researcher did this to check the consistency of the indicators that make up the scale or index to see scores if the indicators are related (Bryman, 2012). Table 4.1 presents the overall Cronbach's alpha (α) was 0.865, which was acceptable internal consistency.

**Table 4.1: Reliability statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardised Items | No. of Items |
|---|---|---|
| 0,865 | 0,869 | 16 |

The researcher tested sub-scale internal consistency. As presented in Table 4.2, the results indicate the sub-scale Cronbach's alpha (α) - financial inclusion barriers (0.6), fintech usage (0.704), fintech adoption (0.718), and benefits and risk awareness (0.634).

**Table 4.2: Sub-scale reliability statistics**

| Construct | Cronbach's Alpha | No. of items retained |
|---|---|---|
| Financial Inclusion Barriers | 0.6 | 4 |
| Fintech Usage | 0.704 | 5 |
| Fintech adoption | 0.718 | 5 |
| Benefits and risk awareness | 0.634 | 2 |
| Overall Cronbach's Alpha | 0.865 | 16 |

Face validity was conducted by sending the questionnaire to the supervisor to check for any repeated, confusing, and leading questions. The researcher then performed a pilot survey with a few selected respondents to ensure he had captured all the questions correctly with no errors. Finally, the researcher used the feedback from the respondents to ensure the questionnaire was correct before the actual survey. However, the analysis and interpretation of the final results did not include results from this pilot survey in the final presentation.

## 4.2 Descriptive statistics

### 4.2.1 Response Rate

The researcher sent the online survey questionnaire to 200 respondents via different online communication channels like email, social media platforms -

WhatsApp, LinkedIn, and Telegram. As a result, 125 responses were completed successfully and were deemed useful for further analysis, which gave a response rate of about 62.5%.

### 4.2.2 Demographic information

The results show that most of the respondents were males (71.2%), and 28.8% of the respondents were females, as presented in Figure 4.1.

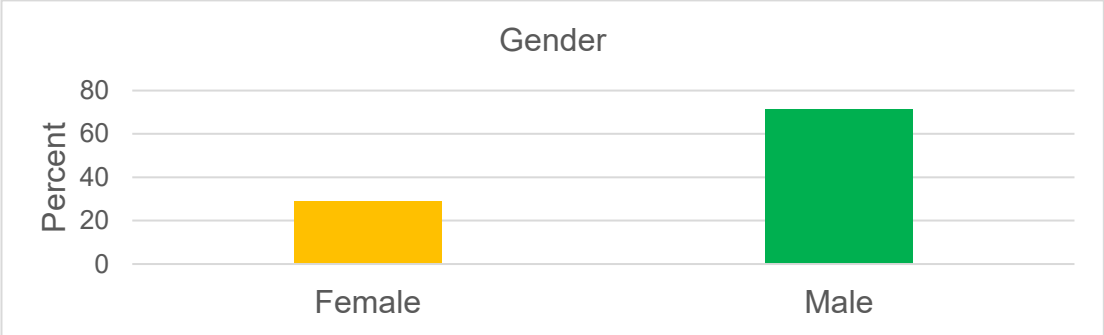



**Figure 4.1: Gender responses**

Most respondents were Africans (85.6%) regarding race, followed by mixed-race (8%). Indians and whites were 3.2% and 2.4%, respectively, while Asians were the least represented with 0.8% of the total sample, as presented in Figure 4.2.

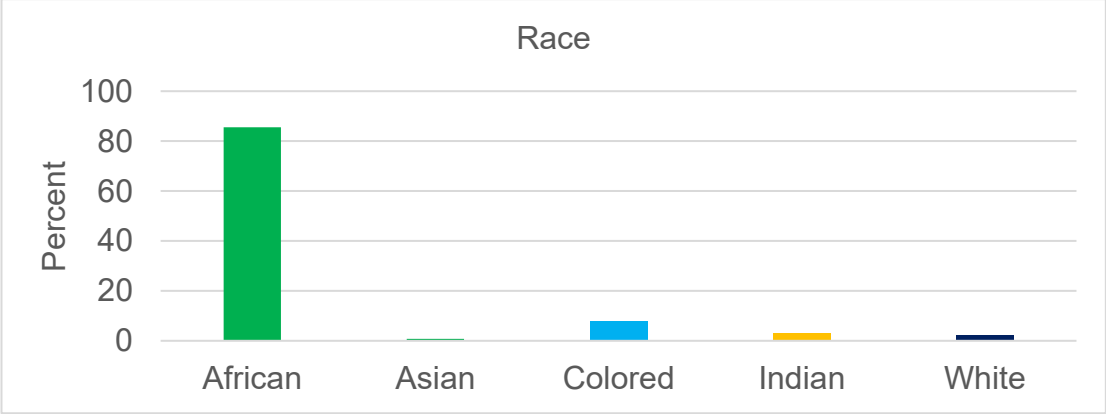



**Figure 4.2: Race responses**

As presented in Figure 4.3, the results show that the age of the respondents ranged from 18-64 years, and the age group, 35-44, had most respondents

(54.3%), followed by 25-34 (24.8%). Age groups 18-24 and 55-64 had the least number of respondents, 1.6% and 0.8%, respectively, of the total sample.

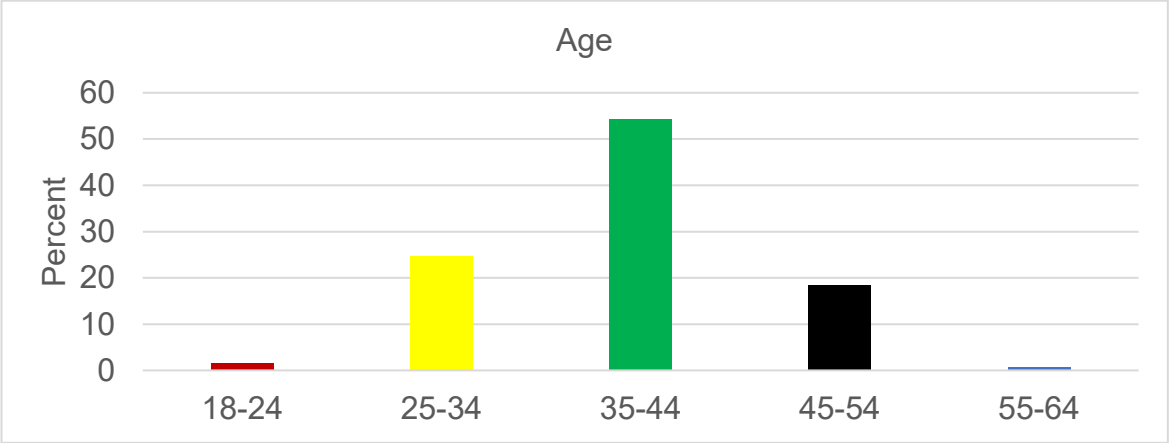



**Figure 4.3: Age responses**

The respondents held different academic qualifications. Figure 4.4 presents the descriptive statistics of educational qualifications. Respondents with a master's degree (37.6%) were the majority, followed by honours degree (23.2%), bachelor's degree (15.2%), diploma (12.8%), matric (6.4%) and, PhD and other qualifications were the least represented by 2.4% each of the total sample. These results were helpful in this study because they provided data regarding the respondents and determine if the sample was representative of the target population when results are generalised.

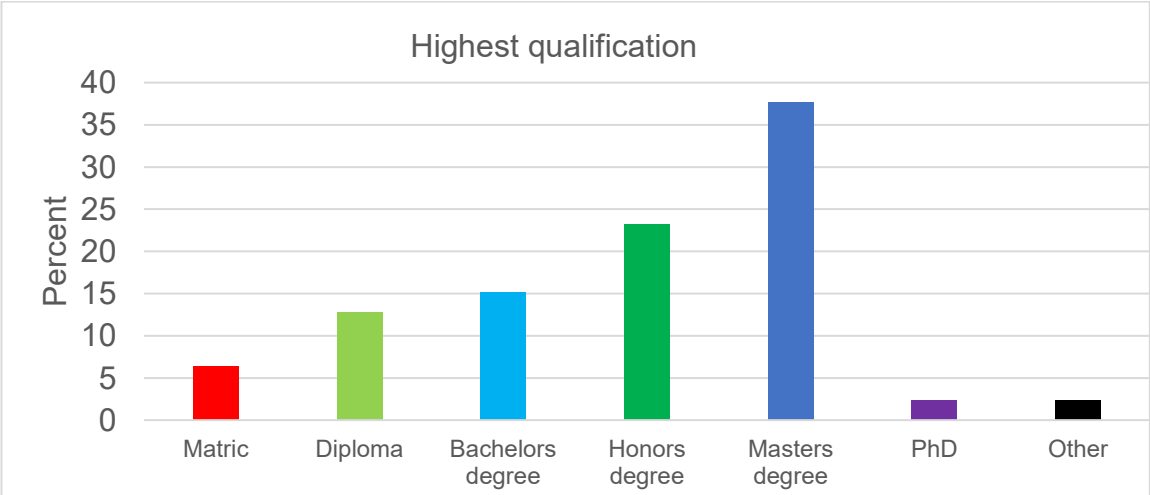



**Figure 4.4: Educational qualification responses**

In terms of employment status, as presented in figure 4.5, most of the respondents were employed (80%), while 16.8% were self-employed, unemployed (1.6%), student (0.8%) and other (0.8%). These results were helpful in this study because they showed if employment status played a role in financial access.




**Figure 4.5: Employment status responses**

The respondents had to indicate a list of online financial products and services they frequently use on a day-to-day basis. As shown in Figure 4.6, the results show the majority of the respondents use online mobile payments and remittance applications (96.8%), e-wallets applications (48.8%) and price comparisons applications (34.3%). The results also show that blockchain and cryptocurrency applications (14.4%), investment and robotic advising applications (12.8%), budgeting applications (12.8%), other applications (10.4%), insurance technology applications (8%), crowdfunding applications (5.6%). There were no responses for online lending applications. These results are significant because it shows which products are popular among the respondents for their day-to-day transactions.

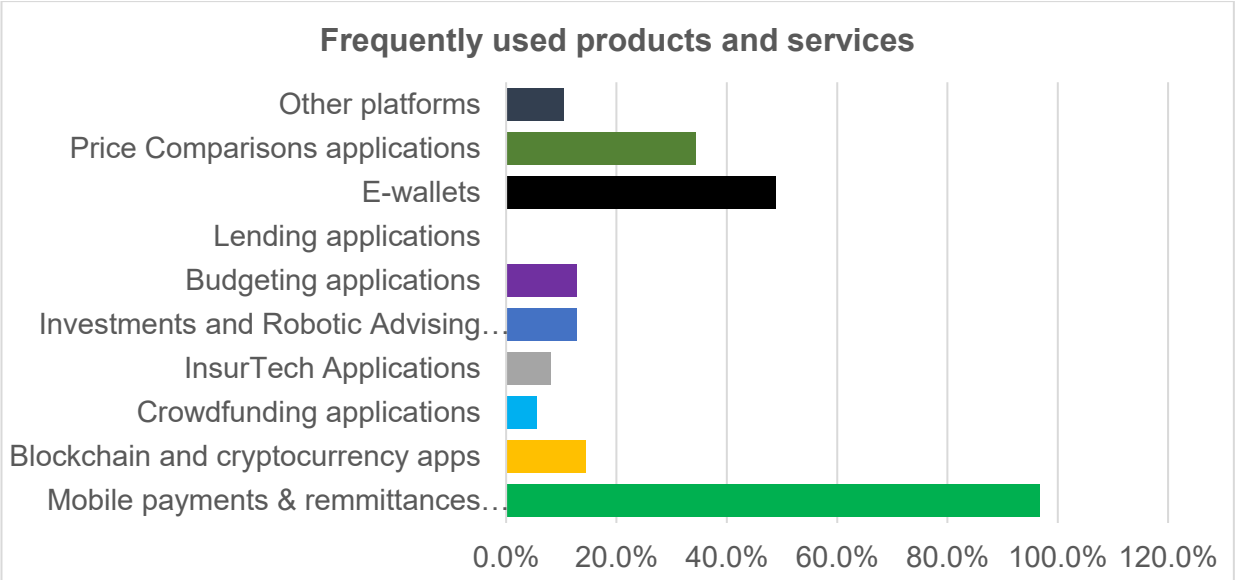



**Figure 4.6: Frequently used fintech products and services**

## 4.3 Effect of fintech adoption and usage on financial inclusion.

Section 4.3 presents the results and hypothesis testing for research question 1 – "Does fintech adoption and usage increase financial inclusion". The research question seeks to understand if the adoption and usage of online financial products and services increase financial inclusion. Sustainable financial inclusion should match the broad adoption of transaction accounts, credit, insurance, and savings products with significant usage, which is sustainable to consumers and service providers (Kessler et al., 2017).

### 4.3.1 Descriptive statistics

As presented in Figure 4.7, the results show that 44% of the respondents strongly agree that they can control and manage their transaction fees or any other additional charges by using online financial products and services. In comparison, 39.2% agree, 12% could neither agree nor disagree, 4% of the respondents disagree, and 0.8% strongly disagree.

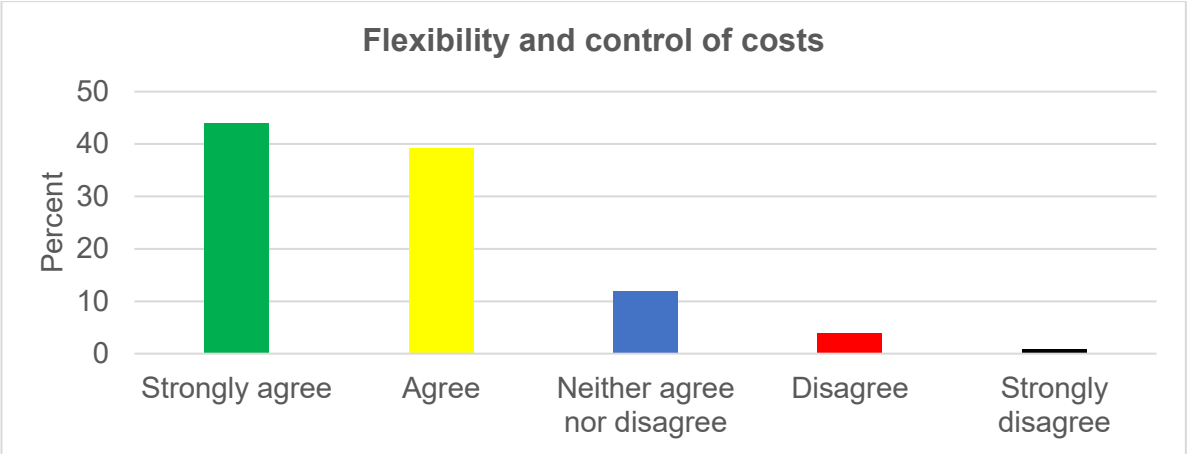



**Figure 4.7: Flexibility and control of costs**

As presented in Figure 4.8, the results show that 45.6% of the respondents strongly agree they are quick to adopt new online financial products and services on the market if they perceive them as easy to use and valuable. In comparison, 43.2% agree, 6.4% neither agree nor disagree, 4% of the respondents disagree, and 0.8% strongly disagree.

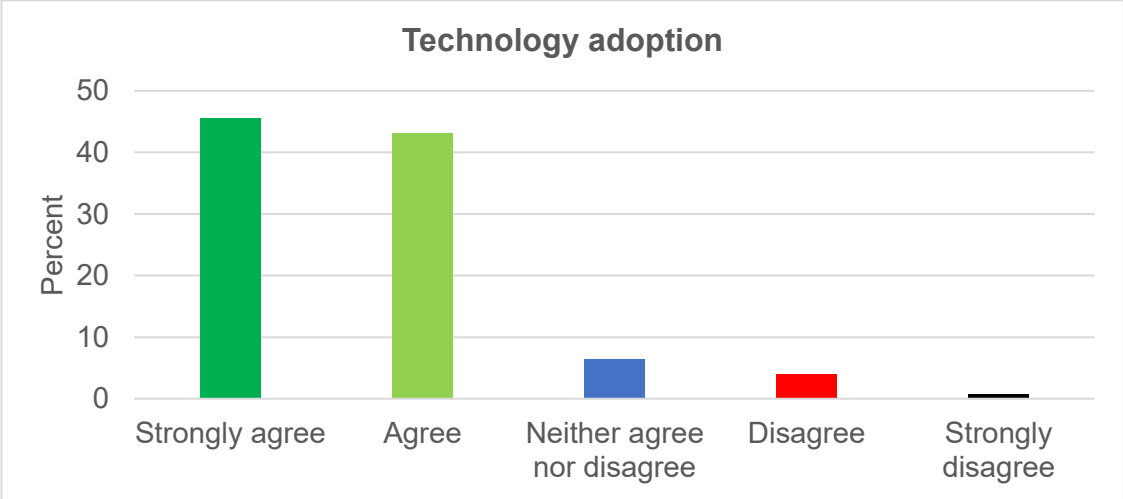



**Figure 4.8: Technology adoption**

As presented in figure 4.9, the results show that the respondents preferred to use online financial products and services for making their payments, savings, budgets, trading than visiting a brick 'n' mortar branch. Of the total sample, 52% of the respondents strongly agree they will transact online, 44% agreed, 3.2% neither agree nor disagree, while 0.8% disagree, no respondents strongly disagreed.

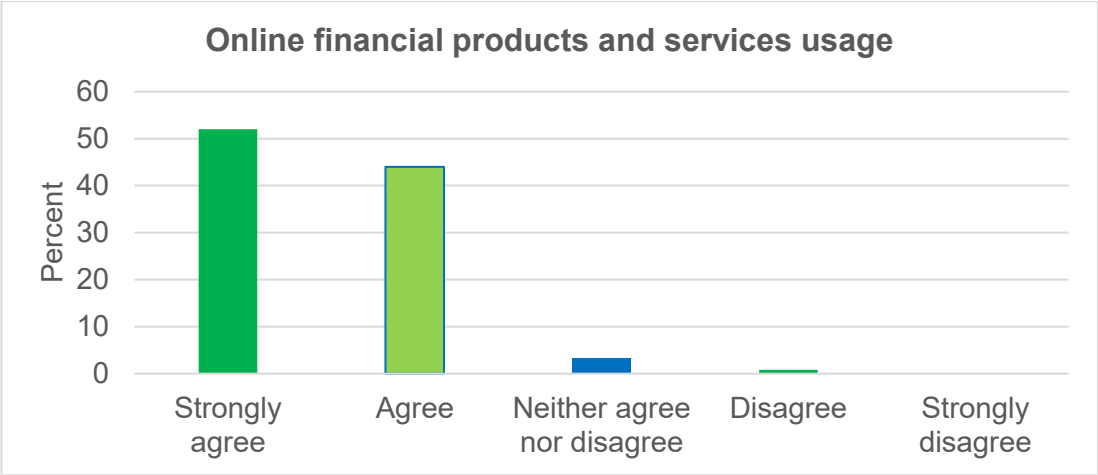



**Figure 4.9: Online financial products and services usage**

As presented in figure 4.10, the respondents also indicated that they used online financial products and services because it was more convenient and safer than visiting the nearest brick 'n' mortar branch. The results show that 54.4% of the respondents strongly agree, 36% agree, 8.8% neither agree nor disagree, 0.8% disagree, and no respondents strongly disagree.

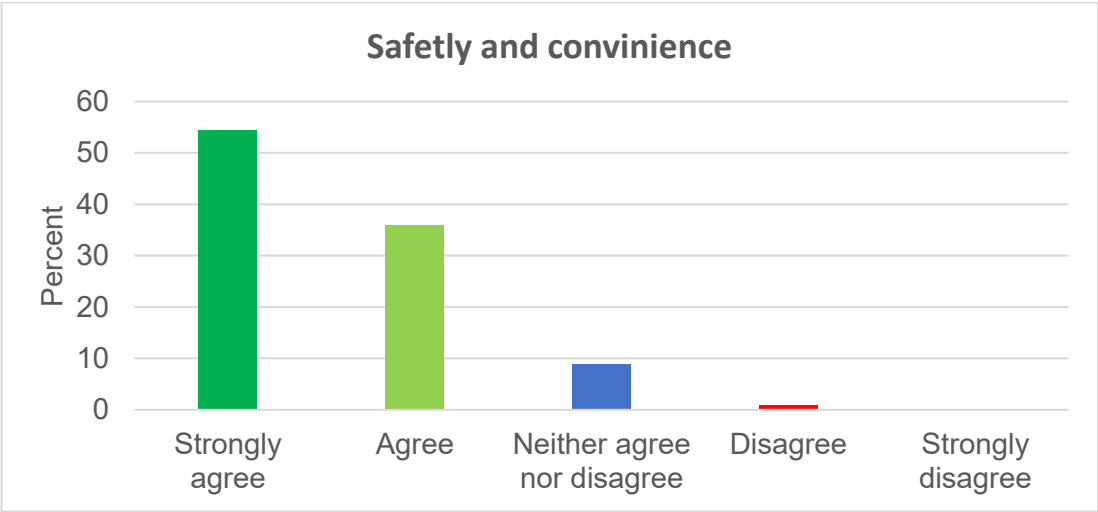



**Figure 4.10: Safety and convenience**

The respondents indicated if the availability of affordable online financial and banking products and services improved their access to financial products and services that meet their day to day needs like payments, savings, credit, and insurance. As presented in figure 4.11, the results indicate that 41.6% strongly agree that online products and services improved their financial access, 55.2%

agree, 2.4% neither agree nor disagree, 0.8% disagree, and no respondents strongly agree.

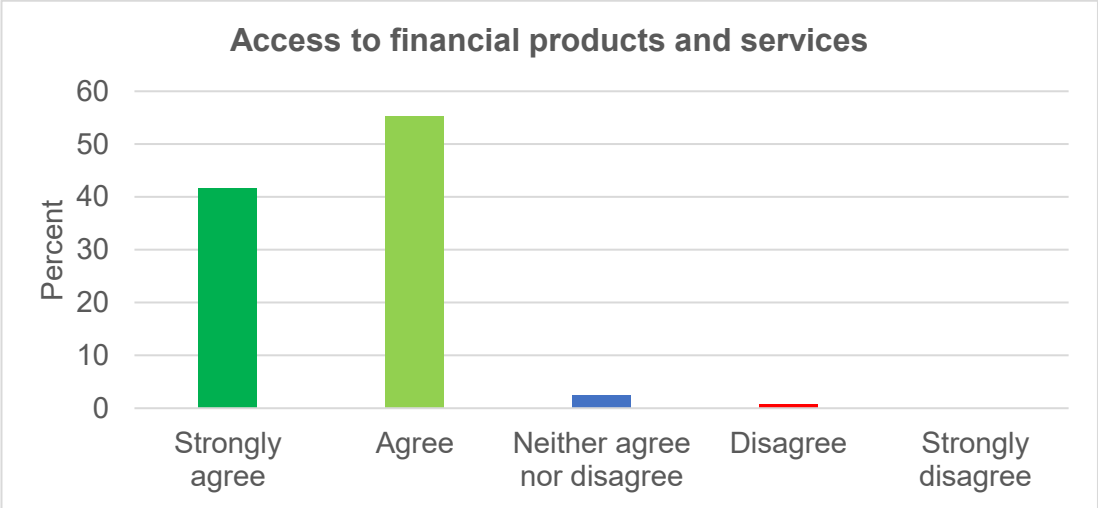



**Figure 4.11: Access to financial products and services**

As presented in figure 4.12, the respondents indicated if they believed the availability of affordable online financial products and services improved their friends and family's financial access. The results show that 37.6% of the respondents strongly agree that online products and services improved the financial access for their family and friends, 53.6% strongly agree, 7.2% neither agree nor disagree, 1.6% disagree, and no respondents strongly disagree.

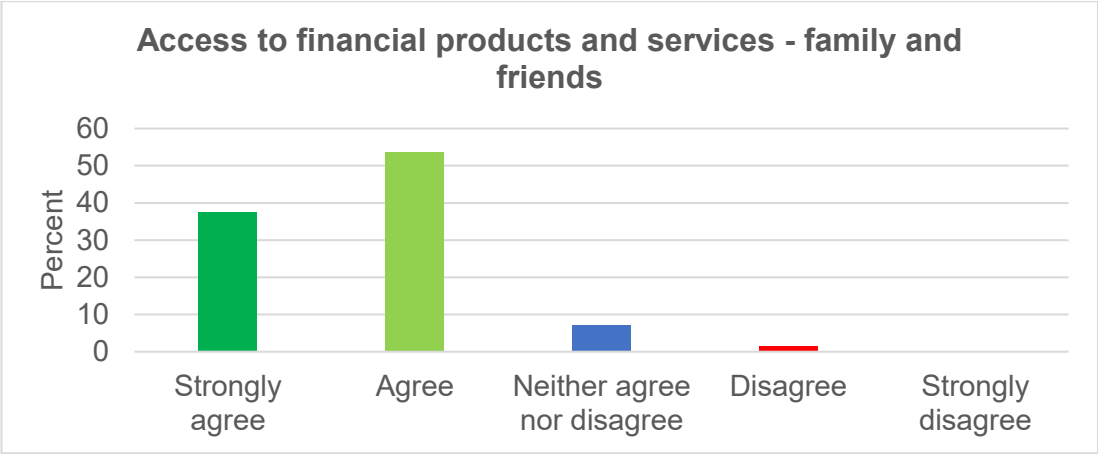



**Figure 4.12: Access to financial products and services - family and friends**

### 4.4.1 Statistical hypothesis testing

In this section, the researcher ran correlation and regression analysis to check for the relationship between the variables and reject or not reject the null hypothesis. Hypothesis $\mathbf{H_0}$ says, “Fintech adoption and usage does not influence financial inclusion”.

The dependant variable was financial inclusion, measured as the financial access to transactional bank accounts, credit, insurance, and savings by all population segments. The independent variables were fintech adoption measured as individuals who have adopted online financial products and services for their day-to-day transactions – transactional banking, credit, insurance, and savings. The other independent variable was fintech usage, measured as the individuals who use fintech products and services for their day-to-day transactions than visiting a physical branch.

#### 4.4.1.1 Correlation analysis

A Pearson product-moment correlation test determined the relationship between the dependant variable (financial inclusion) and the two independent variables, fintech adoption and fintech usage. Table 4.3 presents the correlations between the variables. The results show that the financial inclusion variable and fintech usage variable have a moderate positive correlation ($r=0.438$, $p<0.001$), which is statistically significant, the financial inclusion variable and fintech adoption variable have a moderate positive correlation ($r=0.506$, $p<0.001$) which is statistically significant. In addition, the variables fintech usage and fintech adoption also have a moderate positive correlation ($r=0.583$ $p<0.001$), which is also statistically significant.

**Table 4.3: Pearson correlation - fintech usage, adoption, and financial inclusion**

| | fintech usage | fintech adoption | financial inclusion |
|---|---|---|---|
| fintech usage | 1 | - | - |
| fintech adoption | 0.583** | 1 | - |
| financial inclusion | 0.438** | 0.506** | 1 |

| **. Correlation is significant at the 1% level (2-tailed). |
|---|

Correlation analysis measures the association between variables and alone is not good enough to conclude hypothesis testing hence the need to perform further analysis with more robust regression analysis.

#### 4.4.1.2 Regression analysis

Linear regression explained the relationship between the financial inclusion variable (dependant variable) and two independent variables – fintech adoption and fintech usage.

Regression coefficients described the relationship between the dependent variable (response) and independent variables (predictors) and provided estimates for unknown population parameters. Table 4.4 presents the fintech usage regression coefficient (β=0.215, p=0.023), which shows that fintech usage is a significant predictor of financial inclusion. Fintech adoption regression coefficient (β=0.302, p<0.001) indicates that fintech adoption is a significant predictor of financial inclusion. The constant for the model is 0.731.

**Table 4.4: Regression coefficients – fintech usage and adoption**

| Coefficients | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.731 | 0.146 | | 5.001 | 0.000 |
| | fintech usage | 0.215 | 0.093 | 0.217 | 2.302 | 0.023 |
| | fintech adoption | 0.302 | 0.075 | 0.380 | 4.038 | 0.000 |
| a. Dependent Variable: financial inclusion | | | | | | |

Table 4.5 presents the model summary; the R square value of 0.287 indicates that the model fits the data. This result also suggests that the independent variables – fintech adoption and fintech usage explain a 28.7% variance in the dependent variable – financial inclusion.

**Table 4.5: Model summary – fintech usage, adoption, and financial inclusion**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | |
|---|---|---|---|---|---|---|
| | | | | | F Change | Sig. F Change |
| 1 | 0.536 | 0.287 | 0.276 | 0.44325 | 24.582 | 0.000 |
| a. Predictors: (Constant), fintech adoption, fintech usage | | | | | | |
| b. Dependent Variable: financial inclusion | | | | | | |

The significant effect of fintech adoption and fintech usage support the hypothesis that “Fintech adoption and usage can influence financial inclusion”; thus, there is sufficient evidence to reject the null hypothesis.

### 4.4.2 Comparison of research findings

Previous studies that found similar results include Ismail and Masinge (2012), Kisman (2019) in South Africa, Mago and Chitokwindo (2014), and Thulani, Chitakunye and Chummun (2014) in Zimbabwe, Jack, and Suri (2011) in Kenya and Huang, Wang, and Wang (2020) in China.

## 4.4 Effect of fintech on barriers to financial inclusion

This section presents the results of research question 2 - “Does fintech influence barriers to financial inclusion?”. The research question seeks to understand if fintech influence the barriers to financial inclusion. For example, geographical distance to the nearest bank branch, high transaction costs and fees, transport costs for visiting the nearest bank branch, trust and lack of proper documentation are some of the barriers to financial inclusion (Allen, Demirguc-Kunt, Klapper, & Peria, 2012; Zulfiqar, Chaudhary, & Aslam, 2016).

### 4.4.1 Descriptive statistics

The results presented in figure 4.13 show that 71.2% of the respondents strongly agree that fintech reduces the geographical distance barrier to financial inclusion. In comparison, 24.8% agree, 4% neither agree nor disagree, and no responses disagreed and strongly disagreed.

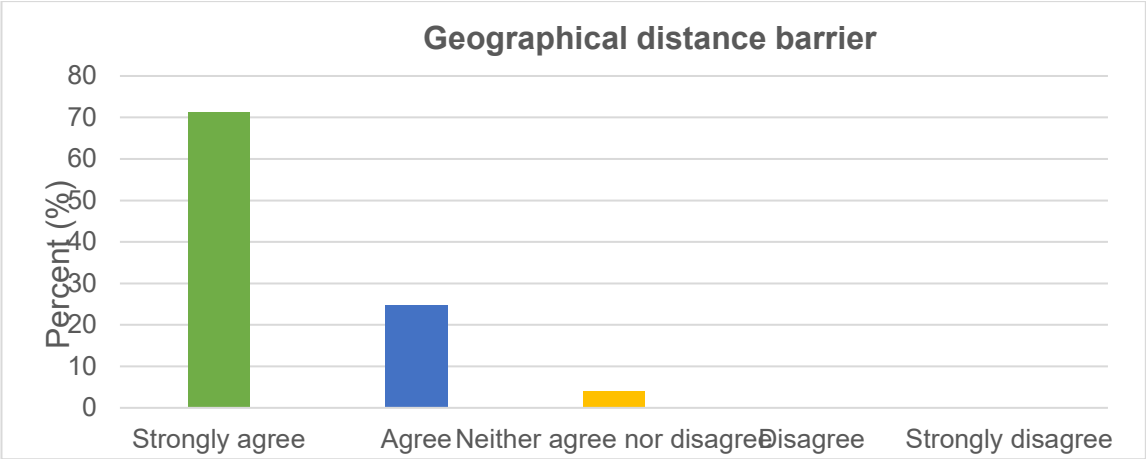



**Figure 4.13: Geographical distance barrier**

Figure 4.14 presents transport costs to the nearest bank branch as a barrier to financial inclusion. The results show that 76% of the respondents strongly agree that fintech products and services reduce transport costs of visiting the nearest bank branch. In comparison, 20.8% agreed that 3.2% of the respondents could neither agree nor disagree, and no responses disagreed and strongly disagreed. The results show that when users use fintech products and services, they save on transport costs.

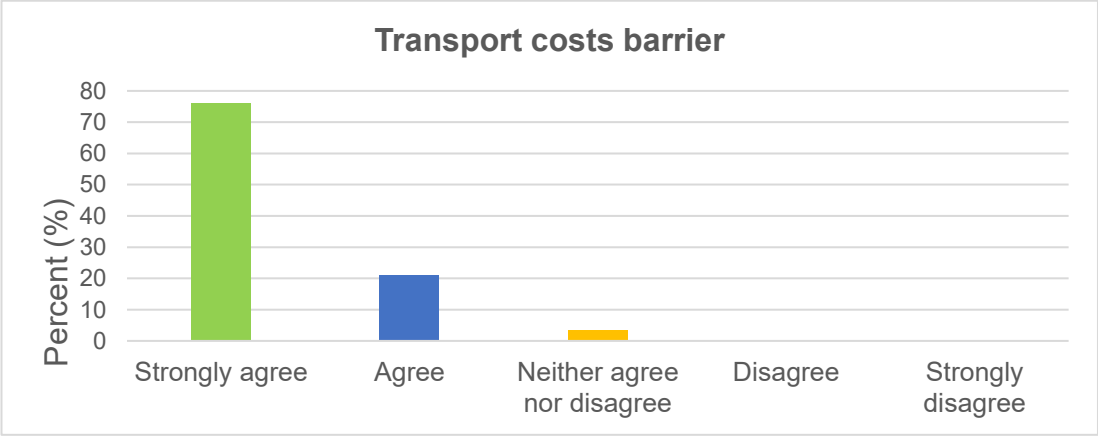



**Figure 4.14: Transport costs barrier**

When it comes to transaction costs and fees as a barrier to financial inclusion, as presented in figure 4.15, the results show that 44.8% of the respondents strongly agree that fintech reduces transaction costs or fess, 39.2% agree. In comparison, 12.8% could neither agree nor disagree, 1.6% disagree, and 1.6% strongly disagree.

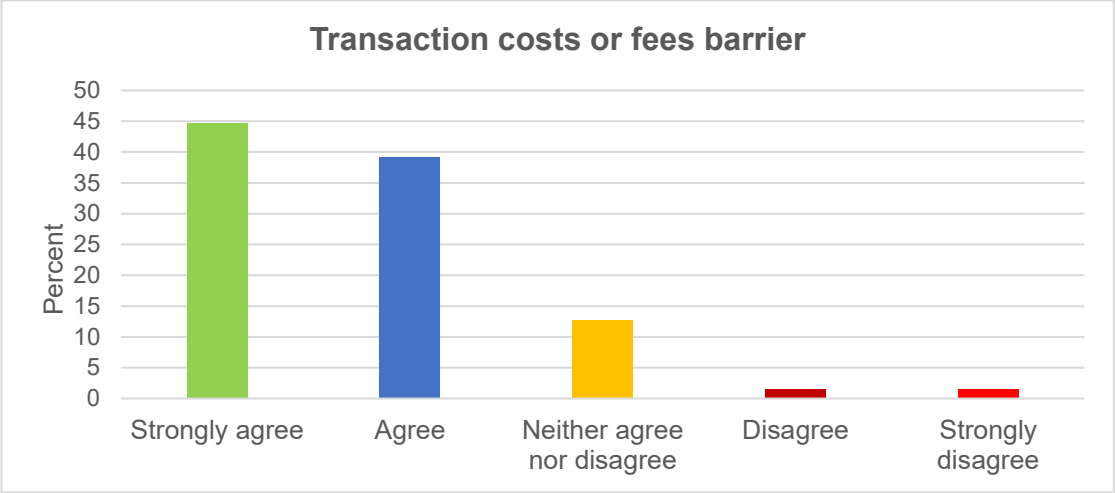



**Figure 4.15: Transaction costs or fees barrier**

Lack of proper documentation is one of the barriers that keep people from accessing formal financial systems. As presented in figure 4.16, the results show that 48.8% of the respondents strongly agree that online products and services require less documentation, 40% agree, 8.8% could neither agree nor disagree, 1.6% disagree, and 0.8% strongly disagree. Thus, the results show that using fintech products and services lessen the documentation requirements from financial service providers.

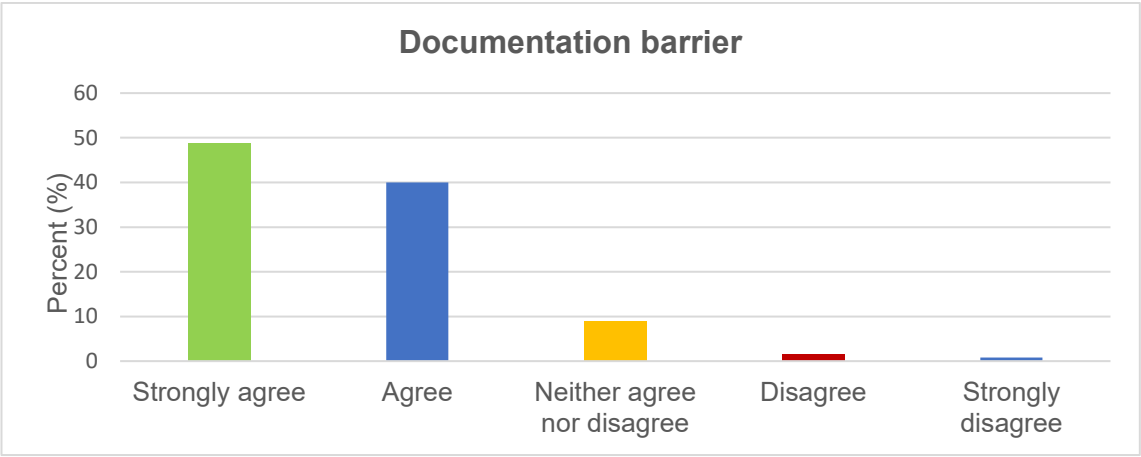



**Figure 4.16: Documentation barrier**

### 4.4.2 Statistical hypothesis testing

In this section, the researcher ran correlation and regression analysis to check for the relationship between the variables and reject or not reject the null hypothesis. The hypothesis **$H_0$** says, “Fintech does not influence barriers to financial inclusion”.

The study used dependant and independent variables. The independent variable was fintech (fintech_var), measured using online financial products and services for transaction accounts, credit, insurance, and savings. The dependant variables were the barriers to financial inclusion - geographical distance to the nearest bank branch, transport costs to the nearest bank branch, transaction costs or fees and lack of proper documentation. In addition, the dependant variables were measured by: - if the respondents agree or disagree if the use of fintech products and services reduce the barriers, as described in Section 3.3.5.2 in objective 2.

#### 4.4.2.1 Correlation analysis – fintech and financial inclusion barriers

The researcher ran a Pearson product-moment correlation test to determine the relationship or association between fintech_var (independent variable) and the individual financial inclusion barrier (dependent variables). Correlation analysis is essential because it helps the researcher to understand the relationship or association between the variables; this is useful to predict how the variables influence each other either positively or negatively (Schober, Boer, & Schwarte, 2018).

Table 4.6 presents the correlations between fintech and financial inclusion variables. The results show that the fintech variable has a moderate positive correlation ($r=0.472$, $p<0.001$) with the geographical distance barrier. Fintech and transport costs barrier show a weak positive correlation ($r=0.380$, $p<0.001$), fintech and transaction costs barriers show a moderate positive correlation ($r=0.584$, $p<0.001$), and fintech and documentation barrier show a moderate positive correlation ($r=0.549$, $r<0.001$). Correlations between the barriers show a moderate positive correlation ($r=0.537$, $p<0.001$) between

distance barrier and transport cost barrier. Distance barrier and transaction costs barrier show a weak positive correlation (r=0.306, p<0.001). Distance barrier and documentation barrier show a weak positive correlation (r=0.154, p<0.001). Transaction costs barrier and transport barrier costs show a weak positive correlation (r=0.333, p <0.001), transport costs barrier and documentation barrier show a weak positive correlation (r=0.237, p<0.001) and a weak positive correlation between transaction costs barrier and documentation barrier.

**Table 4.6: Correlations - fintech and financial inclusion barriers**

| | Fintech_var | Distance barrier | Transport costs barrier | Transaction costs barrier | Documentation barrier |
|---|---|---|---|---|---|
| Fintech_var | 1 | | | | |
| Distance barrier | 0.472** | 1 | | | |
| Transport costs barrier | 0.380** | 0.537** | 1 | | |
| Transaction costs barrier | 0.584** | 0.306** | 0.333** | 1 | |
| Documentation barrier | 0.549** | 0.154 | 0.237** | 0.264** | 1 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | |

Correlation analysis measures the association between variables and alone is not good enough to conclude hypothesis testing, hence the need to perform further analysis with more robust regression analysis.

#### 4.4.2.2 Regression analysis - fintech and financial inclusion barriers

Linear regression explained the relationship between the fintech variable (independent variable) and each financial inclusion barriers variable (dependent variable).

**NB:** The researcher ran regression analysis between the independent variable (fintech_var) and each dependent variable separately, and the results are in Table 4.7.

Regression coefficients described the relationship between the dependent variable (response) and independent variables (predictor) and provided estimates for unknown population parameters. As shown in Table 4.7 below for the distance barrier regression coefficients show that (β=0.473, p<0.001), which means fintech is a significant predictor of distance barrier. As for the transport costs barrier, results show that (β=0.355, p<0.001) means fintech is a significant predictor of the transport costs barrier. The results also show that the transaction costs barrier (β=0.909, p<0.001) means fintech is a significant predictor of the transaction costs barrier. Lack of documentation barrier shows that (β=0.772, p<0.001) means fintech is a significant predictor of lack of documentation barrier. The results indicate that fintech influences financial inclusion barriers. Constants for the models are distance barrier (0.465), transport costs barrier (0.624), transaction costs barrier (0.102) and lack of documentation (0.247).

**Table 4.7: Association between fintech and financial inclusion barriers**

| Dependent variable | Independent variable | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| distance barrier | (Constant) | 0.465 | 0.152 | | 3.071 | 0.003 |
| | Fintech_var | 0.473 | 0.080 | 0.472 | 5.943 | 0.000 |
| transport costs barrier | (Constant) | 0.624 | 0.148 | | 4.199 | 0.000 |
| | Fintech_var | 0.355 | 0.078 | 0.380 | 4.559 | 0.000 |
| transaction costs barrier | (Constant) | 0.102 | 0.217 | | 0.470 | 0.639 |
| | Fintech_var | 0.909 | 0.114 | 0.584 | 7.976 | 0.000 |
| lack of documentation barrier | (Constant) | 0.247 | 0.202 | | 1.224 | 0.223 |
| | Fintech_var | 0.772 | 0.106 | 0.549 | 7.280 | 0.000 |

Table 4.8 below presents the model summary from the regression analysis. The results show that for the distance barrier - a moderate positive overall correlation (r=0.472, p<0.001) and R square value of 0.223 indicates that the fintech variable predicts 22.3% variability in the distance barrier. The results also show that for transport costs barrier – a weak positive overall correlation (r=0.38, p<0.001) and R square value (0.145), which indicates that fintech variable is predicting 14.5% variability in the transport costs barrier variable. The transaction costs barrier shows a moderate positive overall correlation

(r=0.584, p<0.001) and R square value 0.341, which indicates that the fintech variable predicts 34.1% variability in the transaction costs barrier variable. Finally, lack of documentation barrier shows a moderate positive overall correlation (r=0.549, p<0.001) and R square value (0.301), which indicates that the fintech variable is predicting 30.1% variability in the lack of documentation barrier variable.

**Table 4.8: Model summary - fintech and financial inclusion barriers**

| dependent variable | R | R Square | Adjusted R Square | Sig. F Change |
|---|---|---|---|---|
| distance barrier | 0.472 | 0.223 | 0.217 | 0.000 |
| transport costs barrier | 0.380 | 0.145 | 0.138 | 0.000 |
| transaction costs barrier | 0.584 | 0.341 | 0.336 | 0.000 |
| lack of documentation barrier | 0.549 | 0.301 | 0.295 | 0.000 |

The significant effect of fintech on financial inclusion barriers support the hypothesis that “Fintech can influence barriers to financial inclusion.” thus, there is sufficient evidence to reject the null hypothesis.

### 4.4.3 Comparison of research findings

Studies that found similar results include Ismail and Masinge (2012) in South Africa, Dube and Chumman (2019) in Zimbabwe, and Munyengera and Mastumoto (2014) in Uganda, whose results support that mobile money and mobile banking influence barriers to financial inclusion.

## 4.5 Effect of fintech benefits and risk awareness on fintech adoption and usage

Section 4.5 presents the results and hypothesis testing for research question 3 – “Does awareness of benefits and risks associated with fintech influence adoption and usage?”. The research question seeks to understand if the awareness of benefits and risks associated with fintech influence the adoption and usage of online products and services. The integration of finance and technology has presented opportunities that reduce transaction costs,

increase efficiency, and optimise operations in financial services (Zhang & Yang, 2019). However, technology can present risks and challenges like unethical practices by service providers to increase profits and lure unsuspecting customers (Shipalana, 2019).

### 4.5.1 Descriptive statistics

The respondents indicated if they are aware of the benefits of using different online financial products and services before adopting or using them. As presented in Figure 4.17, the results show that 31.2% of the respondents strongly agree that they were aware of these benefits, 51.2% agreed, 11.2% could neither agree nor disagree, 6.4% disagree, and no respondents strongly disagree.

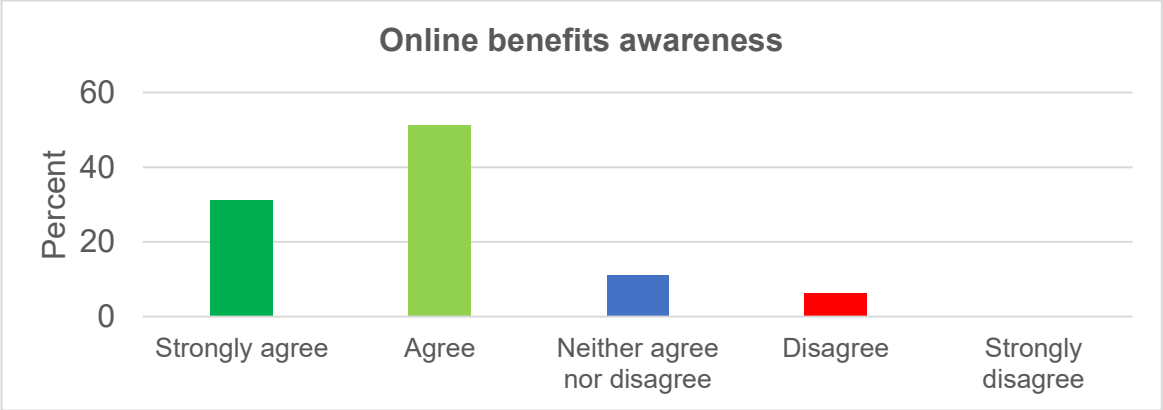



**Figure 4.17: Online benefits awareness**

When it comes to awareness of risks associated with using online financial products and services before adoption or usage, as presented in Figure 4.18, the results show that 44.8% of the respondents adopted or used online products and services and were also aware of the risks associated. In comparison, 42.4% agreed, 9.6% could neither agree nor disagree, 2.4% disagreed, and 0.8% strongly disagreed.

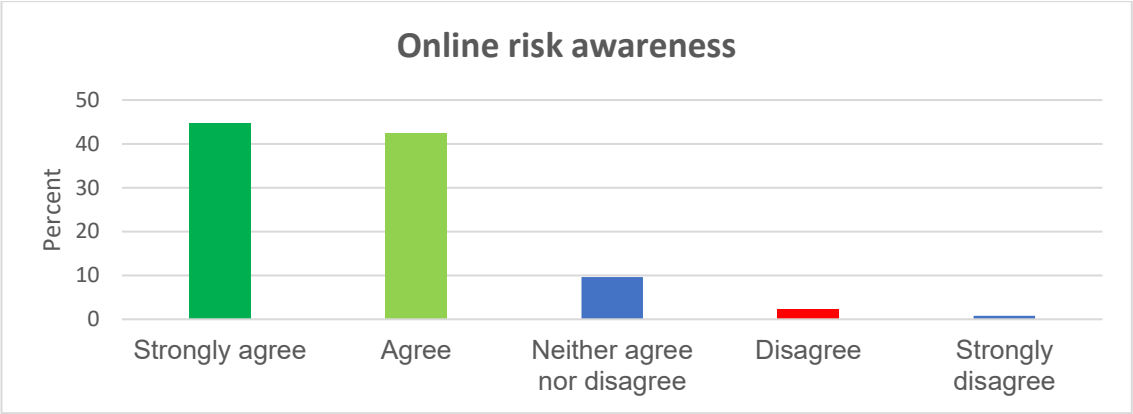



**Figure 4.18: Online risk awareness**

### 4.5.2 Statistical hypothesis testing

In this section, correlation and regression analysis determined the relationship between the variables and to reject or not reject the null hypothesis. Hypothesis **$H_0$** says, "Awareness of benefits and risks associated with fintech does not influence adoption and usage."

The dependent variables were fintech adoption and fintech usage measured as described in Section 4.4.1. The independent variables were benefit awareness measured as the individuals who are aware of the benefits associated with using online products and services, and risk awareness measured as the individuals who are aware of the risks associated with using online products and services.

#### 4.5.2.1 Correlation analysis – fintech adoption, usage, benefits, and risks awareness

Pearson Correlation tests determined the relationship or association between the dependant variables – fintech adoption and fintech usage and the independent variables benefits awareness and risk awareness. Table 4.9 presents the correlation results, which indicate a moderate positive correlation ($r=0.583$, $p<0.001$) between fintech usage and fintech adoption. Fintech usage and benefit awareness have a weak positive correlation ($r=0.312$, $p<0.001$) and fintech usage and risk awareness also have a weak positive correlation ($r=0.178$, $p<0.001$). Fintech adoption and benefit awareness have a weak

positive correlation (r=0.399, p<0.001) and fintech adoption and risk awareness have a weak positive correlation (r=0.302, p<0.001). A moderate positive correlation (r=0.477, p<0.001) exists between risk awareness and benefit awareness. These results show that the variables are increasing together.

**Table 4.9: Correlations - fintech adoption, usage, benefits, and risks awareness**

| | fintech usage | financial adoption | benefit awareness | risk awareness |
|---|---|---|---|---|
| fintech usage | 1 | - | - | .- |
| financial adoption | 0.583** | 1 | - | - |
| benefit awareness | 0.312** | 0.399** | 1 | .- |
| risk awareness | 0.178* | 0.302** | 0.477** | 1 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | | |

Correlation analysis measures the association between variables and alone is not good enough to conclude hypothesis testing hence the need to perform further analysis with more robust regression analysis.

#### 4.5.2.2 Regression analysis – fintech usage, benefits, and risk awareness

Linear regression explained the relationship between the dependent variables - fintech usage and fintech adoption and the independent variables - benefit awareness and risk awareness.

Regression coefficients described the relationship between the dependent variable (response) – fintech usage and independent variables (predictors) – benefit awareness and risk awareness and provide estimates for unknown population parameters. Table 4.10 presents the benefit awareness coefficient (β=0.244, p=0.003), which shows that benefits awareness is a significant predictor for fintech usage. However, the results also show that risk awareness

(β=0.025, p=0.700) is not a significant predictor for fintech usage. Constant for the model is 1.322.

**Table 4.10: Association between fintech usage, and benefits and risk awareness**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.322 | 0.133 | | 9.923 | 0.000 |
| | benefit awareness | 0.244 | 0.081 | 0.294 | 3.003 | 0.003 |
| | risk awareness | 0.025 | 0.064 | 0.038 | 0.386 | 0.700 |
| a. Dependent Variable: fintech usage | | | | | | |

Table 4.11 presents the model summary for fintech usage. R square value of 0.098 indicates the model does not fit the data well, and the independent variables (risk awareness and benefit awareness) explains the 9.8% variance in the fintech usage variable. However, the F statistic value of 6.652 is significant, indicating that the observed $R^2$ value is reliable and can predict the dependant variable.

**Table 4.11: Model summary – fintech usage, benefits, and risks awareness**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | |
|---|---|---|---|---|---|---|
| | | | | | F Change | Sig. F Change |
| 1 | 0.314 | 0.098 | 0.084 | 0.50228 | 6.652 | 0.002 |
| a. Predictors: (Constant), benefit awareness, risk awareness | | | | | | |
| b. Dependent Variable: fintech usage | | | | | | |

Regression coefficients described the relationship between the dependent variable - fintech adoption, and independent variables - benefit awareness and risk awareness. Table 4.12 shows benefit awareness (β=0.343, p=0.001), which indicate that benefits awareness is a significant predictor for fintech adoption. However, the results also show risk awareness (β=0.229, p=0.125), which suggest that risk awareness is not a significant predictor for fintech adoption.

**Table 4.12: Association between fintech adoption and benefits and risks awareness**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 1.114 | 0.159 | | 7.000 | 0.000 |
| | benefit awareness | 0.343 | 0.097 | 0.330 | 3.525 | 0.001 |
| | risk awareness | 0.119 | 0.077 | 0.145 | 1.544 | 0.125 |
| a. Dependent Variable: fintech adoption | | | | | | |

Table 4.13 presents the model summary for fintech adoption. The results show a moderate positive overall correlation ($r=0.419$, $p<0.001$). R square value of 0.175 indicates the model fits the data, and the independent variables (risk awareness and benefit awareness) explains 17.5% variance in the fintech adoption variable.

**Table 4.13: Model summary – fintech adoption, benefits, and risks awareness**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | |
|---|---|---|---|---|---|---|
| | | | | | F Change | Sig. F Change |
| 1 | 0.419 | 0.175 | 0.162 | 0.60005 | 12.957 | 0.000 |
| a. Predictors: (Constant), benefits awareness, risk awareness | | | | | | |
| b. Dependent Variable: fintech adoption | | | | | | |

The significant effect of risk awareness and benefit usage support the hypothesis that “Awareness of benefits and risks associated with fintech influence adoption and usage”; thus, there is sufficient evidence to reject the null hypothesis.

### 4.5.3 Comparison of research findings

The use of technology creates benefits for consumers to engage with financial services; however, some risks come with using these technologies (National Treasury, 2020).

# 5. DISCUSSION OF RESEARCH FINDINGS

Chapter 5 presents the discussion of research results presented in chapter 4. This study has three research questions; Section 5.1 discuss the results of research question 1, which seeks to find out if fintech adoption and usage influence financial inclusion. Section 5.2 will discuss results for research question 2, which aims to determine if fintech can influence barriers to financial inclusion. Section 5.3 will discuss results for research question 3, which seeks to determine if the awareness of benefits and risks associated with fintech can influence fintech adoption and usage. The chapter concludes with Section 5.4, which presents any critical findings of the study.

## 5.1 Effect of fintech adoption and usage influence on financial inclusion

This section presents the discussion of research results for research question 1 – “Does fintech adoption and usage influence financial inclusion?”. - The discussion compares results and findings with the existing literature and established models and theoretical frameworks. While the significant discussion is on the findings from hypothesis testing, this section initially discusses the descriptive statistics in detail.

Based on the descriptive statistics in section 4.3.1, 83% of the respondents agreed that using online financial products and services gave them enough flexibility and control to manage their costs compared to traditional products and services. This result is plausible because fintech innovations have significantly reduced transaction and service costs, thereby providing affordable financial products and services to the financially excluded segments of the population. Mobile network operators like MTN have mobile money products like “*MTN MoMo*” with zero monthly fees, no cash-in fees at MTN stores, free mobile recharge and low transaction fees for sending and receiving money (MTN, 2020). The ability to manage costs, affordability, and convenience are some of the main drivers for mobile money adoption and usage in Zimbabwe (Mutsonziwa & Maposa, 2016).

The results also showed that 90% of the participants used online financial products and services because of safety and convenience issues. This result is plausible because cash transactions are risky due to high crime in the country. Masinge (2010) established; the use of mobile money transfers, mobile banking provides a cheaper, safer, and convenient platform for transacting. However, it is also essential to acknowledge that online transactions are also prone to digital crime or cybercrime, which may deter potential users. In 2019, South Africa recorded 27 928 digital banking fraud cases across banking apps, online banking and mobile banking platforms resulting in over R284 million gross losses to the banking industry (SABRIC, 2020).

When it comes to online financial products and services adoption, 88% of the respondents agreed that they were quick to adopt new products and services available on the market if they perceived them to be beneficial to their needs, affordable and easier to use. These results could be attributed to high smartphone penetration and good mobile network infrastructure in South Africa, making the internet accessible anytime in the country. ICASA (2020) reports that the smartphone penetration reached 91.2% over 53.4 million smartphone subscriptions, and the country's mobile network coverage for 3G (99.7%) and 4G/LTE (92.8%) in 2019 (ICASA, 2020). Literature suggests that low-income earners or consumers at the bottom of the pyramid in South Africa will consider adopting online products and services if they perceive them as valuable and easy to use; however, the cost is the most critical factor for adoption (Masinge, 2010). Ramnath (2018) also found that the adoption of mobile banking in rural South Africa is dependent on factors like perceived cost, ease of use, perceived usefulness, advantages and trust (Ramnath, 2018).

More than 90% of the respondents agreed that the availability of affordable online products and services improved their financial access to transaction accounts, payments, savings, credit, and insurance. This result is plausible because fintech reduces financial access barriers, offer low transaction costs, efficient and allows financial service providers to create low costs products for

low-income segments (Taylor, 2020). Mobile banking and mobile money transfer options offered by South African banks like *e-wallet* - FNB, *Cash Send* - ABSA, *Send-Imali* - Nedbank and *InstantMoney* - Standard Bank. Also, non-banking institutions like Pick'n'Pay, Pepcell, money market service - Checkers and Shoprite provide card-less banking services (Kinsman, 2019). This result support literature that online products and services improves financial access to all segments of the population. Mobile money in rural Zimbabwe improved financial access as it reduced distances to access mobile money agents (Dube & Chummun, 2019). Munyengera (2015) also found mobile money to increase the likelihood of household saving, access to credit and receiving remittances in Uganda (Munyegera, 2015). The use of online products and services can play an essential role in increasing financial inclusion through the rapid growth in mobile payments, banking, and biometric data, which can reduce costs and physical distance barriers (Bimha, 2015).

### 5.1.1 Hypothesis testing discussion

This section discusses the results of the hypothesis tests in detail.

Hypothesis $\mathbf{H_0}$ stated, "Fintech adoption and usage does not influence financial inclusion". The positive correlations between the financial inclusion variable, fintech adoption and fintech usage variable were statistically significant, as shown in Table 4.3, and the test rejected the null hypothesis. Linear regression analysis showed that fintech adoption and fintech usage have a significant and positive effect on financial inclusion, as shown in Table 4.4. The results showed that fintech usage and fintech adoption are significant predictors of financial inclusion. These results are consistent with the literature that adopting and using online financial products and services like mobile money and mobile banking increase financial inclusion (Dube & Chummun, 2019; Masinge, 2010; Munyegera, 2015; Thulani et al., 2014). The use of fintech is increasing financial inclusion in emerging economies, especially in Africa and Asia; adoption and usage of fintech have been associated with economic growth and fintech is helping to close financial inclusion gender gaps, especially during the Covid-19 pandemic (Sahay et al., 2020)

The results presented above supported literature on the technology acceptance model constructs of "*perceived usefulness and perceived ease of use*". These two constructs influence the adoption of online products and services. These findings show users will adopt new technology if they find it helpful and easier to use. Applying extended TAM2 adopted from Ismail and Masinge (2011), the perceived cost significantly influences the adoption of online products and services that support the literature. The perceived economic cost is a significant factor affecting the intention to adopt and use the product or service. In contrast, ease of use motivates the perceived benefits of using the product or service (Wu & Wang, 2005).

According to Rogers (1995), the relative advantage is the degree to which a new idea, innovation or behaviour is perceived as better than its predecessor by the audience regarding its performance, convenience, cost, or risk. The audience should view it as advantageous. The use of fintech products and services provides convenience, reduces costs, and saves on time compared to traditional channels, which increases the likelihood of adoption and usage.

As a result of the benefits offered by fintech products and services, increased adoption and usage increases financial inclusion, especially among the low-income earners, previously excluded, unbanked and under-served segments of the population. When more people have financial access, it reduces poverty and inequality and increases economic growth.

## 5.2 Effect of fintech on barriers to financial inclusion

This section presents the discussion of research findings for research question 2 – "Does fintech influence barriers to financial inclusion?". It compares these findings with literature highlighting similarities, differences and any new insights identified. It also contrasts the results and conclusions with theoretical concepts, models, and frameworks.

This section begins with a detailed discussion of the descriptive statistics presented in Section 4.4.1 concerning the influence of fintech on the following

financial inclusion barriers: geographical distance to the nearest financial services provider branch, transport costs to the closest financial services provider, transaction costs and fees and lack of proper documentation.

Concerning the geographical distance to the nearest financial services provider branch barrier, 83% of the respondents agreed that using online financial products and services distance was no longer a barrier to financial access. This result is plausible because online financial products and services are available 24/7 from anywhere in the country through online platforms like mobile banking and mobile applications; consumers no longer worry about travelling to the nearest branch for financial access. High smartphone penetration and efficient national mobile network coverage bring financial access closer to rural or urban areas. Ramnath (2018) established that mobile banking saved rural people in the Free State from travelling an average distance of 77km to the nearest branch. Other studies also found that mobile money reduced the geographical distance barrier, especially for users in the rural areas who stay in remote areas with limited infrastructure and bank branches (Dube & Chummun, 2019; Ismail & Masinge, 2011; Munyegera & Matsumoto, 2014). The covid-19 pandemic showed the importance of fintech, where people continued to transact online without the need to visit physical branches (Sahay et al., 2020).

The results also show that most respondents (96%) agreed that they saved on transport costs using online financial products and services. They no longer view transport costs to the nearest branch as a barrier to financial access. The inherent characteristics of online financial products and services of convenience and accessibility from anywhere, anytime provide a solution to consumers as they save time and costs of travelling to the nearest branch. This result supports the literature that mobile money offers convenience, saves productive time, and reduces travel costs to the nearest bank branch (Munyegera, 2015; Munyegera & Matsumoto, 2014; Mutsonziwa & Maposa, 2016).

Most of the respondents (83%) agreed that online financial products and services reduced transaction costs and fees. The result is plausible because most people are not comfortable paying high monthly service charges to financial service providers. They would instead go for low-cost product and services where they can pay once-off transaction fees. Ivatury and Pickens (2006) observed that; WIZZIT users in South Africa found mobile banking affordable, low cost, convenient, easily accessible compared to high fees associated with bank branches and ATMs (Ivatury & Pickens, 2006). The use of online mobile technologies like M-PESA, AliPay, WIZZIT, Ecocash, WeChatPay and others has significantly reduced transaction costs in the payments space compared to the traditional payment mechanisms (Patwardhan, Singleton, & Schmitz 2018). The use of online financial products and services increases the likelihood of household savings and receiving remittances because of reduced transaction costs (Munyegera, 2015).

The lack of proper documentation required by financial service providers is a barrier to financial access. Results show that 88% of the respondents agreed that online financial products and services significantly lessened the documentation barrier. Makore (2014) established that the use of WIZZIT Bank in South Africa enabled foreign nationals, especially undocumented immigrants, hawkers, taxi drivers and low-income groups, to get financial access – opening accounts without a lot of supporting documentation (Makore, 2014). Fintech companies like Mukuru provide payment and remittance services that enable foreign nationals to send money to their home countries like Zimbabwe, Botswana, Kenya, DRC, China with fewer documentation requirements (Mukuru, 2021). Biometric data for user authentication and verification could play a vital role in increasing financial inclusion, especially for segments of the population having difficulties with proper documentation like immigrants, unemployed and the elderly (Bimha, 2015).

The discussion presented above, on descriptive statistics of the responses, shows that online financial products and services influence financial inclusion barriers. As the literature suggested, the most common barriers to financial inclusion reported in South Africa include high bank fees, lack of trust in

financial institutions, and proper documentation required by banks (Kessler et al., 2017). The following section further argues whether fintech significantly influences the barriers to financial inclusion based on regression analysis, which is more robust than descriptive analysis.

### 5.2.1 Hypothesis testing discussion

Hypothesis **$H_0$** stated, “Fintech does not influence barriers to financial inclusion.” The positive correlations between the fintech variable and the individual barriers were statistically significant, as shown in Table 4.6, and the hypothesis test rejected the null hypothesis. Linear regression analysis showed that the fintech variable is a significant predictor of the financial inclusion barriers variable, as shown in table 4.7. These results are consistent with the literature. The possible reasons for the findings have already been discussed in the descriptive statistics in the above section. Linear regression had positive coefficients because the survey questions asked respondents to indicate if they agree or disagree if fintech reduced the barriers to financial inclusion. The barriers variables are described in Section 3.3.5.2 under Objective 2.

The technology acceptance model states that perceived usefulness is “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p. 320). The model also states that perceived ease of use “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). The findings support the literature because online financial products and services give users convenience; they are easy to use (Mutsonziwa & Maposa, 2016)

The descriptive statistics, correlation and regression findings are consistent. Therefore, we can conclude from the results that fintech influences financial inclusion barriers; users no longer perceive geographical distance, transport costs, transaction costs, and lack of documentation as barriers to financial access.

## 5.3 Effect of fintech benefits and risks awareness on fintech adoption and usage.

This section presents the discussion of research findings for research question 3 – “Does awareness of benefits and risks associated with fintech influence adoption and usage?”.

Based on the descriptive statistics presented in Section 4.5.1, the results presented show that 82% of the respondents agreed that awareness of the benefits associated with online financial products and services influenced their decision of adoption and usage. The high percentage of respondents who agreed that awareness of benefits influenced fintech adoption and fintech usage could be attributed to efficient target marketing by various service providers advertising the benefits of their products and services to consumers. Lack of awareness of the benefits offered by different online financial products and services could lead to low adoption or under-utilisation of the products; hence aggressive marketing strategies are needed to increase adoption, usage and trust (Mas & Radcliffe, 2010). Ismail and Masinge (2011) established that; people at the bottom of the pyramid or low-income earners in South Africa will adopt mobile banking when the value and benefits of using the service are evident (Ismail & Masinge, 2011). Thulani et al. (2014) found that rural households had low adoptions of loans and savings on online savings platforms due to a lack of awareness of the benefits offered on these platforms (Thulani et al., 2014). The use of online financial products and services provides many benefits like convenience, accessibility, ease of use, lower costs and handling less cash and security (Pankomera & Van Greunen, 2018).

When it comes to the awareness of risks associated with online financial products and services, most respondents (87%) agreed that risk awareness influenced their decision for adoption and usage. Fear of losing money through online fraud is the main reason why most respondents familiarise themselves with the risks. In 2019, South Africa recorded 27 928 digital banking fraud cases across banking apps, online banking and mobile banking platforms resulting in over R284 million gross losses to the banking industry (SABRIC,

2020). Perceived risks associated with online products and services like digital fraud, cybercrime, information security and usage uncertainty impact adoption and usage (Pankomera & Van Greunen, 2018).

### 5.3.1 Hypothesis testing discussion

Hypothesis $\mathbf{H_0}$ stated, “Awareness of benefits and risks associated with fintech does not influence fintech adoption and usage.” The null hypothesis was rejected by positive correlations, as shown in Table 4.9. Linear regression presented showed that benefits awareness is a significant predictor of fintech usage. The results support literature: perceived benefit and perceived usefulness influence user intention and attitude to use online banking (Lee, 2009). Perceived benefits, which is a significant incentive for acceptance, influence consumers' behavioural intention to use mobile banking (Lu, Chang, Li, & Chang, 2013).

Linear regression results, however, showed that risk awareness is not a significant predictor for fintech usage. Thus, although the descriptive statistics presented in Section 5.4.1 showed that users familiarise themselves with perceived risks associated with fintech, regression analysis shows that risk awareness does not determine usage. These results support the literature; a study by Masinge (2010) showed that perceived risk did not have any effect on the use and adoption of mobile banking by the low-income earners - bottom of the pyramid in South Africa (Masinge, 2010). However, in other studies, Lu et al. (2013), Zhou (2011) found that perceived risk negatively influenced consumers' behavioural intention to use mobile banking services (Lu et al., 2013; Zhou, 2011).

In addition to benefit awareness on fintech usage, fintech adoption was used as a dependent variable. Linear regression results presented showed that benefits awareness is a significant predictor of fintech adoption. These results are consistent with the literature; perceived benefit influence the user's behavioural intention to adopt mobile banking (Lee, 2009). The results also show that risk awareness is not a significant predictor for fintech adoption.

Again, these results support the literature; a study by Masinge (2010) showed that perceived risk did not affect the adoption of mobile banking by the low-income earners in South Africa (Masinge, 2010). However, other studies show that perceived risk influence the intention to adopt and use mobile banking (Lu et al., 2013; Zhou, 2011).

Applying the integrated model by Masinge (2010), the perceived benefit awareness influences fintech adoption and usage. Low-income earners in South Africa will adopt and use mobile banking services when they see benefits, usefulness, and accessibility to use products (Masinge, 2010). However, the perceived risk awareness also plays a negative role in fintech adoption and usage.

From the discussion above, users make sure that they are aware of the benefits associated with fintech before adopting and using the products and services. Benefits awareness influence the adoption and usage of fintech products and services. However, understanding the risks associated with fintech does not affect the adoption and use of fintech products and services.

## 5.4 Conclusion

The discussion presented above shows that fintech adoption and fintech usage are significant predictors of final inclusion. The findings show that fintech adoption and fintech usage can increase financial inclusion among the low-income and financially excluded population segments. The results have also revealed that fintech is a significant predictor of financial inclusion barriers like geographical distance, high transaction costs, transport costs and lack of documentation barriers. The use of fintech reduces these barriers; user no longer perceives them as a significant barrier to financial access. The findings have also shown that awareness of the benefits associated with fintech is a significant predictor of fintech adoption and fintech usage. In contrast, awareness of the risks related to fintech is not a significant predictor of fintech usage and fintech adoption—awareness of benefits associated with fintech influences fintech adoption and fintech usage among the respondents.

# 5. SUMMARY, CONCLUSIONS, IMPLICATIONS, LIMITATIONS, AND RECOMMENDATIONS

Chapter 5 presented a discussion of the research findings and compared these findings to other similar studies. This chapter will summarise the entire report in Section 6.1, and Section 6.2 present the conclusions. Next, section 6.3 will show the implications of the results and limitations in Section 6.4. Finally, the research concludes with areas for further study in Section 6.5.

## 6.1 Summary

Providing affordable financial products and services to all population segments has become a critical priority for most governments worldwide. The positive impact of financial inclusion in reducing poverty, inequality and increasing economic growth has made financial inclusion of crucial importance for many countries (Demirguc-Kunt, Klapper, & Singer, 2017). Leveraging fintech has been identified as a critical enabler to deliver quality and affordable financial products and services to the financially excluded and under-served population segments (National Treasury, 2020). This study sought to determine if the implied financial inclusion in South Africa was associated with fintech adoption and usage on the ground. Distance to the nearest branch, high transaction fees, transport costs to visit a branch and lack of proper documentation have been highlighted as some of the barriers to financial inclusion (Kessler et al., 2017a). This study also sought to determine if fintech influenced these financial inclusion barriers.

Literature has shown that fintech can increase financial inclusion by reducing transaction costs, increasing efficiency, and allowing financial services providers to tailor cheap products for the poor. However, digital technologies in the finance industry come with risks and challenges like cybercrime, data governance, and privacy issues (Pazarbasioglu et al., 2020). Literature has also shown that poor financial inclusion can lead to social exclusion, mental health issues, over-indebtedness, difficulties finding employment and accessing credit (Gloukoviezoff, 2007; Hajaj, 2002).

The study utilised a quantitative research strategy with a cross-sectional or survey design. Non-probability sampling with convenience sampling method was employed. A total of 125 respondents participated in the online survey, which was sent to adults above 18 and residing in South Africa. Data collection used the online platform Survey Monkey, and it was analysed using SPSS v27. The researcher used descriptive statistics to describe and summarise the data and correlation and regression analysis to analyse data and hypothesis testing. The researcher performed reliability and validity tests to establish how truthful, credible, and believable the research findings are and increase confidence in the results (Neuman, 2014).

Reliability tests showed that the overall Cronbach's alpha for the data collection instrument was 0.865. Most of the respondents were male and aged between 35-44 years of age. The results also showed that most respondents used online mobile payments and remittance applications, price comparisons applications for their day-to-day transactions. The first research question showed moderate positive correlations between fintech adoption, fintech usage and financial inclusion. Regression analysis showed that fintech adoption and fintech usage are significant financial inclusion predictors, and the null hypothesis was rejected.

The second research question showed that most respondents agreed that fintech reduced the barriers to financial inclusion. Correlation analysis and regression analysis supported the results, and the null hypothesis was rejected. The third research question showed that the benefits and risks associated with fintech influenced their choice of fintech adoption and usage for most respondents. Correlation analysis showed weak positive correlations between fintech usage, fintech adoption, and risk and benefits awareness. Regression analysis showed that benefits awareness is a significant predictor for fintech usage and fintech adoption. However, risk awareness is not a significant predictor of fintech usage and fintech adoption.

The discussion on research findings showed that the results supported the literature. The findings show that fintech adoption and fintech usage positively

influence financial inclusion; the use of fintech products increases financial inclusion. The findings also show that respondents agree that fintech products and services reduce financial inclusion barriers like geographical distance, transport costs, transaction costs, and proper documentation. The results showed that awareness of the benefits associated with fintech was a significant predictor of fintech adoption and usage. In contrast, awareness of the risks related to fintech was not a significant predictor of fintech adoption and used amongst the respondents.

## 6.2 Conclusions

The study sought to determine the perceived impact of fintech on financial inclusion in South Africa. The significant findings from this study showed that fintech products and services influence financial inclusion. Fintech adoption and usage of online products and services increase financial inclusion improving financial access for low-income segments. The study also found that fintech influence financial inclusion barriers like geographical distance to the nearest branch, transport costs, transaction costs and lack of proper documentation. Awareness of benefits associated with fintech influence the choice for adoption and usage. In contrast, awareness of the risks associated with fintech does not influence the adoption and use of fintech.

## 6.3 Implications of the results

The results of this study have implications for the different stakeholders in South Africa. First, the results have shown that fintech has a positive influence on financial inclusion. From a policy perspective, the results of this study are essential to the government as it addresses priority 16 in the draft financial inclusion policy framework by National Treasury, “Leveraging fintech disruptors to promote and support financial inclusion” (National Treasury, 2020, p. 4). Second, the results of this study can also help financial institutions, fintech start-ups, and the government work together to increase financial inclusion in the country. The results can assist financial institutions in finding ways of collaborating with fintech start-ups to make online financial products and services affordable to consumers and profitable to them. In addition, these

institutions can work closely with policymakers in government to create a regulatory and conducive environment that promotes digital and financial innovation. Third, the results have shown that fintech influences financial inclusion barriers like distance, higher costs, and documentation challenges. The results are essential to ordinary persons because they no longer need to worry about the long distances, higher costs, or lack of documentation whenever they need financial access. Lastly, the study will also contribute to the academic body of knowledge and expand the existing literature on the impact of fintech on financial inclusion.

## 6.4 Limitations

The study had some limitations. First, due to the Covid-19 pandemic, the data collection was strictly online. This limited data collection from low-income segments as some respondents could not participate in the online survey due to a lack of electronic devices with access to the internet. Second, non-probability sampling with convenience sampling method was used for data collection, which means the findings cannot be generalised to the entire population. Third, the study focused on the consumer side only; it would have been helpful to get the opinions of service providers regarding the sustainability of their products and services to increase financial inclusion. Fourth, the sample size of 125 respondents was too small, making the generalisation of results for the entire South African population difficult, and most of the respondents were from Gauteng province. Finally, on the second research question related to financial inclusion barriers, the study measured the respondents' sentiment, if they believed fintech reduced the barriers to financial inclusion.

## 6.5 Policy Recommendations

These policy recommendations will contribute to financial inclusion in South Africa. The policymakers working in collaboration with all the relevant stakeholders like financial institutions, start-up fintech companies should create a conducive regulatory environment and policy frameworks that promote sustainable financial innovations. The government can encourage

sustainable financial innovations by providing tax incentives to service providers and also ensure consumers are adequately protected.

Financial institutions should collaborate with fintech start-ups companies to create affordable and profitable financial products and services. Collaboration between these stakeholders will promote risk-sharing, increase market share and cross-selling.

The government and relevant stakeholders should promote financial literacy and encourage consumers to take advantage of digital financial products and services for transactional banking, savings, insurance, wealth management etc.

## 6.6 Recommendations for future research

Future studies can investigate the impact of fintech on sustainable financial inclusion, which will look at both the consumers and service providers perspectives. Future research should also consider how financial services providers like banks can collaborate with start-up fintech companies to create sustainable financial products and services that will serve all population segments. There is also a need to conduct qualitative studies that will use in-depth interviews and focus group discussions with low-income segments on getting their views on digital financial inclusion. Finally, future research can also consider the use of longitudinal research design to understand better the impact of fintech over a more extended period.

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## Appendix 1.1: Data collection instrument(s)

**INFORMED CONSENT LETTER**

Ethics protocol number: **WBS/BA720361/810**

Dear Participant,

You are invited to participate in an academic research study conducted by Leonard Runyowa (Student No: 720361), Master of Business Administration student from Wits Business School, at the University of Witwatersrand.

This self-completion questionnaire is in partial fulfilment of requirements this program, I am working on a research project titled “Perceived impact of fintech on financial inclusion in South Africa”.

The aim of this study is to determine the relationship between financial technologies (fintech) and financial inclusion. This will help us understand how technology can be used as a driver to bring the financially excluded to participate in the mainstream economy. Your participation in this study will be greatly appreciated and your responses will enable the researcher to complete the study successfully.

This is an **anonymous** study survey, and your name will not appear on the questionnaire. All the information you provide will be used for academic purposes and will be treated in **strict confidence.** Your participation in this research study is **voluntary** and you are free to withdraw your participation from this study at any time with no ramifications.

All the information collected for this study will be stored in a password protected computer database and only this researcher will have access to the information.

The survey should take you less than 10 minutes to complete.

If you need any information, please feel free to contact me on the details provided below.

Thank you so much for your participation.

Kind Regards,

Leonard Runyowa.

Email: 720361@students.wits.ac.za or runyowa@gmail.com

Mobile No: (071)2966241

**NB: <u>By completing the survey you agree to participate in this research study.</u>**

**<u>Instructions for completing the questionnaire.</u>**

**Section A: Demographics**

Please mark with an 'X' in the appropriate box provided.

1. Gender

| | |
|---|---|
| Male | |
| Female | |

2. Race

| | |
|---|---|
| African | |
| Asian | |
| Coloured | |
| White | |
| Indian | |

3. Age

| | |
|---|---|
| Less than 25 years | |
| 25 – 30 years | |
| 31 – 35 years | |
| 36 – 40 years | |
| More than 40 years | |

4. Marital Status

| | |
|---|---|
| Married | |
| Single | |
| Divorced | |
| Other | |

5. Highest Qualification

| | |
|---|---|
| Matric | |
| Diploma | |
| Degree | |
| Honours Degree | |
| Master | |
| PhD | |
| Other | |

6. Occupation status

| | |
|---|---|
| Employed | |
| Self-employed | |
| Student | |
| Not employed | |
| Retired | |

7. Which province do you live in South Africa?

| | |
|---|---|
| Gauteng | |
| Eastern Cape | |
| Free State | |
| KwaZulu-Natal | |
| Limpopo | |
| Mpumalanga | |
| Northern Cape | |
| North West | |
| Western Cape | |

**Section B: Fintech and Financial Inclusion**

| | | | |
|---|---|---|---|
| **Q8** | Do you any use online financial products and services for your day-to-day transactions like online banking, online shopping, online trading etc? | Y | |
| | | N | |
| **Q9** | **Please Mark with X**<br>**Please indicate which online financial products and services do you use the most.** | | |
| | Mobile payments / remittances e.g., online banking, online shopping, PayPal | | |

| | | |
|---|---|---|
| | Blockchain and Cryptocurrency e.g., Bitcoin, Ripple, Ethereum | |
| | Crowdfunding e.g., GoFundMe, Kickstarter | |
| | Insurance – InsurTech | |
| | Investments - Robotic Advising and online stock trading | |
| | Budgeting applications e.g., 22seven, Moneysmart, MyMoney, My Financial Life | |
| | E-wallets personal finance | |
| | Other (Specify……...) | |

**Please indicate the extent to which you agree or disagree with the following questions below, using the scale below:**

| Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |

| **Fintech and Financial Inclusion** | | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** |
| Q10 | By using online financial products and services geographical distance to the nearest financial service provider branch is no longer a barrier to financial access | | | | | |
| Q11 | Using online financial products and services is more convenient and safer than visiting the nearest brick 'n' mortar or physical bank branch. | | | | | |
| Q12 | Using online financial products and services reduces transport costs and saves on time of visiting a physical bank branch | | | | | |
| Q13 | Using online financial products and services reduces transaction costs or bank fees, it is cheaper and affordable | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Q14 | Using online financial products and services gives me control and flexibility to manage my transaction costs or additional charges | | | | | |
| Q15 | I use online financial products and services because they are safe and secure | | | | | |
| Q16 | I use online financial products and services because they offer best user experience, best value and can help me achieve my financial goals | | | | | |
| Q17 | By using online financial products and services lack of proper documentation is no longer a barrier to financial access | | | | | |
| Q18 | I am quick to adopt new online financial products and services on the market that meet my needs | | | | | |
| Q19 | I have had the opportunity to try different online financial products and services on the market | | | | | |
| Q20 | I prefer to use online financial products and services for doing my payments, savings, budgets, trading etc | | | | | |
| Q21 | I have adopted online financial products and services because they save my financial goals (payment & remittance transactions, insurance, savings, and credit) | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Q22 | I am aware of the benefits associated with online financial products and services for savings, payments, borrowing, crowd funding etc. | | | | | |
| Q23 | I am aware with of risks associated with the use online financial products and services | | | | | |
| Q24 | Use of online financial products and services has improved my savings behaviour | | | | | |
| Q25 | Use of online financial products and services has made credit application, budgeting, price comparisons, online payments, and remittances easier and quicker | | | | | |
| Q26 | Availability of affordable online financial or banking services have improved my access to financial products and services that meet my needs e.g., transactions, payments, savings, credit, and insurance | | | | | |
| Q27 | Availability of affordable online financial or banking services have improved my family and friends' access to financial products and services that meet their needs e.g. payments, savings, credit, and insurance. | | | | | |

## Appendix 2.1: One-page bio of the researcher including declaration of interest in the research and funders, if any

The author of this study declares no sponsors or conflict of interest in conducting this study. This study is done purely for academic purposes in partial fulfilment of the Master of Business Administration degree requirements.

## Appendix 2.2: Ethic documentation

**Graduate School of Business Administration**
**University of the Witwatersrand, Johannesburg**

Wits Business School

**Wits Business School Ethics Committee**
Constituted under the University Human Research Ethics Committee (Non-Medical)

### Ethics Clearance Certificate

**Ethics protocol number:** WBS/BA720361/810
*This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).*

| | |
|---|---|
| **Project title** | The impact of fintech on sustainable financial inclusion in South Africa |
| **Investigator / Researcher** | MR LEONARD RUNYOWA |
| **Nature of Project** | MBA (Research Article) |
| **Decision of the Committee** | Approved, provided stakeholders and participants are guaranteed anonymity and confidentiality. |
| **Issue Date of Certificate** | 2021-03-18 |
| **Expiry date** | Date of submission of the project report |
| **Chairperson** | Prof Anthony Stacey<br>☎ +27 11 717 3587<br>+27 82 880 4531<br>Anthony.Stacey@wits.ac.za |

**Declaration by Researcher**

*One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.*

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

18/03/2021.
Date: