THE DISRUPTIVE IMPACT OF FINANCIAL TECHNOLOGIES ON THE FINANCIAL SERVICES INDUSTRY IN SOUTH AFRICA

by

SIMPHIWE KHETHUKUTHULA CELE

submitted in accordance with the requirements for
the degree of

DOCTOR OF BUSINESS LEADERSHIP

at the

Graduate School of Business Leadership
UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: Professor Vusi Gumede

JULY 2023

DECLARATION

Name: Simphiwe Khethukuthula Cele

Student number: 57647577

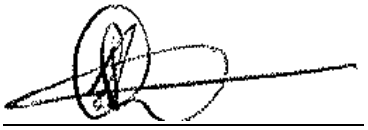
Degree: Doctor of Business Leadership

Title: **The disruptive impact of financial technologies on the financial services industry in South Africa**

I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.



SIGNATURE DATE: 31 July 2023

ACKNOWLEDGEMENTS

I want to express my gratitude to all those who have helped me with this project. First and foremost, I want to thank my parents, Mr Muntu and Mrs Tiki Esther Cele, for their unwavering support and guidance throughout my life. Mama, your prayers have been the foundation of my upbringing, and I am forever grateful. Baba, thank you for setting an example of hard work and dedication. Thank you both for showing me the importance of education and encouraging me to pursue my dreams.

I want to thank my sister, Mrs Lucy Malunga, for her unwavering support. I am also grateful for the guidance of my late brother Sibongiseni and the belief in me and my dreams from my late sister Silindile. This work is also dedicated to the memory of my late siblings, Nkonzo, Bhekinkosi, and Sibusiso.

I also want to thank my wife, Boitumelo Cele, for her support. This work proves to my children, Naledi and Ntokozo, that anything is attainable through hard work and determination. Qiniso, Mimi, Nkosi, Nhlaka, Sphe, Letho, and Alwande, I hope this inspires you.

I cannot forget to mention my friend, Dr Mohlamatsane Mokhatla, who has been there for me from the beginning of this journey, providing me with academic support. I am also grateful to my other friends, Dr Siyavuya Bulani and Dr Solomon Ntladi, for encouraging me to start this project. I would also like to sincerely thank Dr Thabang Ramogodi, who constantly exchanged notes and ideas throughout our academic journey.

I also want to thank Prof. Raphael Mpofu for his help in the early stages of this work. I would also like to express my gratitude to the academics who reviewed the draft of my thesis before the examination. It would be amiss not to express gratitude to Prof. Breggie van der Poll and Tumelo Seopa for administrative support at the School of Business Leadership. Lastly, but most importantly, I want to thank my supervisor, Prof. Vusi Gumede, for guiding me throughout this journey. Words cannot express my gratitude for his unwavering support and guidance.

All glory goes to God.

ABSTRACT

The financial services industry in South Africa has been experiencing disruptions due to the emergence of financial technologies (fintechs). Therefore, the primary objective of this study was to investigate the impact fintechs have on the financial services industry in South Africa. A mixed methods research design was used with an inductive approach and pragmatism paradigm to accomplish this. Interviews were conducted with eighteen industry experts and seventeen customers, while one hundred and twenty customers completed questionnaires. Qualitative data were analysed using Atlas.ti for thematic analysis, and SPSS was used for quantitative analysis. Structural equation modeling was employed to develop the fintech adoption model.

The findings showed that fintechs positively and negatively impact the financial services industry. While they have a negative impact on established financial services providers (incumbents) and regulators, they have a positive impact on consumers. The negative impact includes reduced profits for incumbents, increased competition for incumbents, and regulatory risks. However, fintechs have also brought significant benefits to the industry, such as cost reduction for financial institutions, lower prices for financial products and services for consumers, improved efficiency, personalised products, and services, increased financial inclusion, convenience, and innovation. In response to the negative impact, incumbents have responded to this disruption by collaborating with fintechs, expanding their roles, improving customer experience, and reducing prices of financial products and services. Regulators have also established regulatory frameworks, such as the Intergovernmental Fintech Working Group and National Payment System Framework and Strategy Vision 2025, to address these disruptions.

This study has shown that the COVID-19 pandemic has accelerated the adoption of fintechs in South Africa. The study also discovered that several factors influence the adoption of fintechs in South Africa, including perceived costs, facilitating conditions, perceived risk, perceived trust, ubiquity, and self-efficacy. The study suggests ways for incumbents to improve competitiveness and customer satisfaction while advocating for regulatory adjustments to accommodate fintechs. This study contributes to the attainment of the sustainable development goal number nine.

Keywords

Financial technology, fintech(s), technological innovations, innovation, financial services, digital bank, cryptocurrencies, peer-to-peer, mobile payment, blockchain, crowdfunding, crowd lending, COVID-19, adoption, regulators, incumbents, disruption, disruptive innovations.

ISIFINQO

Imboni yezinsizakalo zezezimali eNingizimu Afrika ike yabhekana nokuphazamiseka ngenxa yokuvela kobuchwepheshe bezezimali (eyaziwa ngokuthi yi-fintechs). Ukuphenya umthelela we-fintechs embonini, lolu cwaningo lusebenzise idizayini yocwaningo lwezindlela ezixubile ngendlela yokufundisa kanye nepragmathizimu pharadimu yepragmatism. Inhlolokhono yenziwe nochwepheshe bemboni abayi-18 namakhasimende ayi-17, futhi amakhasimende ayi-120 agcwalisa imibuzo. Idatha yekhwalithi yahlaziywa kusetshenziswa i-Atlas.ti yokuhlaziywa kwetimu, futhi i-SPSS yasetshenziselwa ukuhlaziya inani. Imodeli yesakhiwo sezibalo yasetshenziswa ukuthuthukisa imodeli yokwamukela i-fintech.

Okutholakele kubonisa ukuthi i-fintechs inomthelela omuhle futhi omubi embonini yezinsizakalo zezezimali. Nakuba benomthelela ongemuhle kubahlinzeki benkonzo yezezimali asebekhulile (abasesikhundleni) kanye nabalawuli, banomthelela omuhle kubathengi. Umthelela ongemuhle uhlanganisa inzuzo encishisiwe yalabo abasezikhundleni, ukwanda kokuncintisana kwabaphethe kanye nezingozi zokulawula. Kodwa-ke, i-fintechs nayo ilethe izinzuzo ezibalulekile embonini, njengokwehliswa kwezindleko zezikhungo zezezimali, amanani aphansi emikhiqizo yezezimali namasevisi kubathengi, ukusebenza kahle okuthuthukisiwe, imikhiqizo eqondene nomuntu siqu kanye nezinsizakalo, ukukhuphuka kokufakwa kwezimali, ukunethezeka nokusungula izinto ezintsha. Ukusabela kumthelela ongemuhle, abasesikhundleni baye basabela kulokhu kuphazamiseka ngokusebenzisana ne-fintechs, ukwandisa izindima zabo, ukuthuthukisa ulwazi lwamakhasimende nokunciphisa amanani emikhiqizo namasevisi ezezimali. Abalawuli baphinde basungula izinhlaka zokulawula, ezifana ne-Intergovernmental Fintech Working Group, Uhlaka Lukazwelonke Lohlelo Lokukhokha kanye Nombono Wecebo Ka-2025, ukuze kubhekwane nalokhu kuphazamiseka.

Lolu cwaningo luveze ukuthi ubhubhane loKhuvethe lusheshise ukwamukelwa kwe-fintechs eNingizimu Afrika. Ucwaningo luphinde lwathola ukuthi izici ezimbalwa zinethonya ekwamukelweni kwe-fintechs eNingizimu Afrika, okuhlanganisa izindleko ezicatshangwayo, izimo ezisizayo, ubungozi obucatshangelwayo, ukwethembeka okucatshangwayo, ukutholakala kwendawo yonke kanye nokusebenza kahle kwakho.

Amagama abalulekile

Ubuchwepheshe bezezimali, I (ama-) fintech, ukuthuthukiswa kwezobuchwepheshe, ukusungula izinto ezintsha, izinsizakalo zezezimali, ibhange ledijithali, ikhriphtokharensi , ontanga kuya kontanga, inkokhelo yeselula, uchungechunge lwebhulokhi, uxhaso lweningi, ukubolekwa kweninngi, iKhuvethe, ukutholwa, izilawuli/ ophethe isikhundla, ukuphazamiseka izinto ezintsha eziphazamisayo.

TSHOBOKANYO

Intasitiri ya ditirelo tsa matlotlo mo Aforika Borwa e itemogela dikgoreletsi ka ntlha ya go tlhagelela ga dithekenoloji tsa matlotlo (fintechs). Go batlisisa ka ga tshusumetso ya difintech mo intasitiring, tshekatsheko e e dirisitse mekgwa e e tswakantshitsweng ya popo ya dipatlisiso gammogo le mokgwa o o tlhotlheletsang le wa tekatekano. Dipuisano di tshotswe le baitseanape ba intasitiri ba ba 18 gammogo le bareki ba le 17. Bareki ba le 120 bone ba tladitse dipotsopatlisiso. Atlas.ti e ne ya dirisiwa go sekaseka tshedimosetso ya khwaletheithifi gammogo le tshekatsheko ya tlhogo, mme SPSS e ne ya diriswa go ka sekaseka tshedimosetso ya khwanthitheithifi. Modula wa tekatekano ya popego o dirisitswe go ka bopa modula wa kamogelo ya fintech.

Diphitlhelelo di supa fa difintech di tshusumetsa intasitiri ya ditirelo tsa matlotlo ka ditsela tse di siameng le tse di sa siamang. Le fa di na le ditshusumetso tse di sa siamang mo batlameding ba ba itlhomileng ba ditirelo tsa matlotlo (batshodi) le mo balaoding, di na le tshusumetso e e siameng mo bareking. Tshusumetso e e sa siamang e akaretsa dipoelo tse di fokotsegileng tsa batshodi, kgaisano e e oketsegileng ya batshodi gammogo le botshosetsi jwa bolaodi. Le fa go le jalo, difintech di tlisitse dipoelo mo intasitiring jaaka ditshenyegelo tse di fokotsegileng tsa ditheo tsa matlotlo, ditlhotlhwa tse di kwa tlase tsa dithoto le ditirelo tsa matlotlo tsa bareki, bokgoni jo bo tokafaditsweng, dithoto le ditirelo tse di lebaganeng le beng ba tsone, kakaretso ya matlotlo e e oketsegileng, nolofatso le tlhamoseŝwa. Ka go leka go ka baakanya tshusumetso e e sa siamang e, batshodi ba tsere tshwetso ya go ka dirisanyammogo le difintech, go atolosa ditiro tsa bone, go tokafatsa maitemogelo a bareki le go ka theosa ditlhotlhwa tsa dithoto le ditirelo tsa matlotlo. Go siamisa dikgoreletsi tse, balaodi le bone ba tlhamile matlhomeso a bolaodi, jaaka Intergovernmental Fintech Working Group, National Payment System Framework le Strategy Vision 2025.

Tshekatsheko e e supile gore leroborobo la COVID-19 le itlhaganedisitse tiriso ya difintech mo Aforika Borwa. Tshekatsheko e e fitlhetse gape le gore dintlha tse di mmalwa di tlhotlheletsa tiriso ya difintech mo Aforika Borwa mme di akaretsa ditshenyegelo tse di bonwang, maemo a a tlhofofatsang, botshosetsi jo bo bonwang, boikanyego jo bo bonwang, tlwaelego le boitshepi.

Mafoko a a botlhokwa

Thekenoloji ya matlotlo, (di)fintech, ditlhamodišwa ka thekenoloji, tlhamoseŠwa, ditirelo tsa matlotlo, panka ya dijithale, matlotlo a khiripto (cryptocurrencies), balekane/badirimmogo, tuelo ka mogala wa letheka, ketane ya diboloko (block chain), kgodiso ya matlotlo-ka-setšhaba, kadimomadi ya setšhaba, bolwetsi jwa COVID-19, tiriso, balaodi, batshodi, sekgoreletsi, ditlhamodišwa tse di kgoreletsang

TABLE OF CONTENTS

List of Tables

List of Figures

List of Abbreviations

4G	Fourth Generation Network
4IR	Fourth industrial revolution
5G	Fifth-Generation Network
ABSA	Amalgamated Bank of South Africa
AI	Artificial Intelligence
AML	Anti-Money Laundering
AMOS	Analysis of Moment Structures
API	Application Programming Interfaces
ATM	Automatic Teller Machine
BFA	Bali Fintech Agenda
BRIC	Brazil, Russia, India, China
CCSA	Competition Commission South Africa
CFA	Confirmatory Factor Analysis
CFI	comparative fit index
CFT	Combating the Financing of Terrorism
COVID-19	Coronavirus Disease 2019
CRM	Customer Relationship Management
DC	Compact Discs
DSV	De Sammensluttede Vognmænd
DVD	Digital Versatile Disc
EFA	Exploratory Factor Analysis
ESG	Environmental, Social and Governance
FAIS	Financial Advisory and Intermediary Services
FCSA	Financial Sector Conduct Authority
FIC	Financial Intelligence Centre
FNB	First National Bank
GB	Gigabyte
HTMT	Heterotrait-monotrait
IBM	International Business Machines
ICT	Information and Communication Technology

ID	Identity Document
IDT	Innovation Diffusion Theory
IFWG	Intergovernmental Fintech Working Group
IMF	International Monetary Fund
KB	Kilobytes
KMO	Kaiser-Meyer-Olkin
LATAM	Latin America
MB	Megabytes
MFS	Mobile Financial Services
ML	Machine Learning
MM	Motivational Model
MNO	Mobile Network Operators
MPCU	Model of [Personal Computer Utilisation
MVNO	Mobile Virtual Network Operator
N26	Number 26
NBS	Natal Building Society
NCR	National Credit Regulator
NFC	Near Field Communication
NFI	normed fit index
NPSD	National Payment Systems Department
P2P	Peer-to-Peer
PASA	Payment Association of South Africa
PC	Personal Computer
PIB	Payment Industry Body
POC	Proof of Concept
PPE	Personal Protective Equipment
QR	Quick Response
RMSEA	Root Mean Square Error of Approximation
RPA	Robotic Process Automation
RPP	Rapid Payment Programme

RSA	Republic of South Africa
SA	South Africa
SARS	South African Reserve Bank
SARS	South African Revenue Service
SCA	Social Cognitive Theory
SDG	Sustainable Development Goals
SEM	Socio-Economic Measure
SFNB	Security First Network Bank
SME	Small and Micro Enterprise
SMS	Short Message Services
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan Africa
TAM	Technology Acceptance Model
TLI	Tucker–Lewis Index
TPB	Theory of Planned Behaviour
TPPP	Third-Party Payment Provider
TRA	Theory of Reasoned Action
TSM	Trusted Service Manager
TV	Television
UAE	United Arab Emirates
UK	United Kingdom
UNISA	University of South Africa
USA	United States of America
USB	Universal Serial Bus
UTAUT	Unified Theory of Acceptance and Use of Technology
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

1.1. BACKGROUND

In today's competitive market, organisations that fail to innovate risk losing their market share. A lack of creativity can significantly reduce an organisation's competitiveness, leading to its eventual demise (Koren et al., 2016). Therefore, organisations must continually generate new ideas and values to ensure their future growth and existence (Mauborgne and Kim, 1999). Mol and Birkinshaw (2009) agree that organisations must continuously innovate by introducing new systems, practices, products, and services to adapt to the ever-changing business landscape. The importance of innovation has been emphasised in literature dating back to 1912, with scholars highlighting its role as a driver of industry transformations and economic growth. Schumpeter's (1942) theory of creative destruction underscores the need to replace the old with the new to create better products and opportunities. For instance, the advent of the automobile industry replaced the horse and equestrian transportation industry, leading to more efficient transportation methods and greater convenience for consumers. Although this process may lead to job losses in the old industry, it ultimately leads to progress and innovation.

Industries such as textiles, camera films, and movie rentals have all experienced significant technological advancements that led to major changes in the market. In the 19th century, machines replaced many workers in the textile industry, while digital cameras replaced camera films in the 2000s. This had a significant impact on Kodak, once a large organisation that employed thousands of people, resulting in a significant loss of market share, and ultimately filing for bankruptcy in January 2012 (Ho and Chen, 2018).

The movie rental industry has undergone numerous transformative changes, particularly with the advent of streaming services like Netflix. When Netflix first launched its online movie streaming interface in 1997, it faced a lukewarm response from customers. However, it gradually gained popularity over time, and in the past decade, it has disrupted the traditional rental digital versatile disc (DVD) video industry. Companies like Blockbuster have closed due to the rise of movie streaming. People who once waited in long queues at DVD rental shops have now switched to more convenient ways of obtaining movies, such as online movie streaming (Christensen et al., 2015). The financial services industry has also witnessed significant technological advancements., and this research specifically explores the technological changes in this sector.

Changes in the financial services industry

The emergence of technological innovations driven by the fourth industrial revolution (4IR) has brought significant changes to the financial services industry (World Economic Forum, 2016). These innovations known as fintechs, a shortened term for financial technologies (Gelis and Woods, 2017; Magnuson, 2018) or a technology-enabled financial solution (Arner, Barberis and Buckley, 2015; Buckley, Arner and Barberis, 2016; Gomber, Koch and Siering, 2017; Saksonova and Kuzmina-Merlino, 2017) have disrupted the industry by providing technology-enabled financial solutions that improve consumer experience (Truong, 2016) through faster, cheaper, and customised financial products and services (Varga, 2017; Chen and Robinson, 2019). Fintechs are filling the gaps left by traditional financial institutions and promise to change the industry in unprecedented ways (Bruggink and Mouilleron, 2016; Lee and Shin, 2018)

Financial technologies

Financial technologies are becoming increasingly popular, with mobile payments, digital-only banks (also known as neobanks), economy sharing or peer-to-peer platforms, and virtual currencies or cryptocurrencies being the most common examples (Davis and Maddock, 2017; Zetzsche, Buckley and Arner, 2017; Cai, 2018). The rise of these technologies is due to the advent of the internet, artificial intelligence, machine learning, big data, algorithms, blockchain (Buckley, Arner and Barberis, 2016) and recently, the emergence of the COVID-19 pandemic (Dwolatzky and Harris, 2020). The COVID-19 pandemic forced organisations across all industries to devise strategies that would ensure business continuity during the peak of the outbreak in 2020 and early 2021 (Wójcik and Ioannou, 2020). As a result, during this period, in the financial services industry people hastened the adoption of fintechs (Baret et al., 2020).

Fintechs have brought about significant changes in financial services, including the way financial decisions are made in banking, wealth management, lending, and more (Dirican, 2015; Maskey, 2018). These technologies affect all stakeholders in the financial services industry, presenting both risks that threaten financial stability and opportunities for incumbent companies, customers, and the entire industry (Cortez, 2014; Wall, 2018; Xu, Tang and

Guttman, 2019). As a result, financial technologies are considered one of the most significant developments affecting and changing the world's economy.

Lemonade Inc. is revolutionising the insurance industry in the United States of America (USA) by offering a fully digital service through its app and website. Unlike traditional insurance companies, Lemonade does not rely on brokers to handle quotes and claims. Instead, they utilise artificial intelligence and chatbots to perform these tasks. Other companies, such as Oscar, Clover Health, Policy Bazaar, Zhong An, League, and Metromile, also use technology to provide insurance services (Bruggink and Mouilleron, 2016; Buckley, Arner and Barberis, 2016; Win and Doyle, 2018).

The banking industry has seen a rise in digital-only banks like Nubank, Number 26 (N26) Bank, Monzo, Atom Bank, Revolut, Solaris Bank, and Starling Bank. These banks conduct all banking activities online, thereby transforming the way financial services and products are provided (Enders *et al.*, 2006; Buckley, Arner and Barberis, 2016; Bansal and Jain, 2018). In the Republic of South Africa (RSA), new players like Tymebank, Discovery Bank, and Bank Zero have emerged over the past five years, offering digital-only banking services.

In recent years, crowdfunding, and peer-to-peer lending organisations such as Du Xiaoman Financial, SoFi, Oak North, Kreditech Holdings, We Lab, Dianrong, Kabbage, Affirm, Future Finance, Lendingkart, Lendix, Guia Bolso, and Wonga in South Africa and the United Kingdom (UK) have gained popularity. These organisations differ from traditional financial institutions in their business models, which heavily rely on financial technologies. Additionally, they do not have physical branches, resulting in lower costs for their products compared to traditional financial services (Truong, 2016; Saal, Starnes and Rehermann, 2017; Didenko, 2018; Jagtiani and Lemieux, 2018; Lee and Shin, 2018; Magnuson, 2018). Another significant development in the industry has been the emergence of cryptocurrencies like Bitcoin and blockchain technology, which have revolutionised the financial services sector (Cong and He, 2019).

1.2. THESIS STATEMENT

The fourth industrial revolution in financial services driven by financial technologies like artificial intelligence, machine learning, big data, and robotics is reforming the financial services industry. It has resulted in several improvements and challenges in service delivery that have increased efficiency, brought convenience for consumers, and created a diversity of new products and services that are more accessible and more affordable to consumers, new regulatory risks, and more competition for the incumbents. Many observers believe these new technologies are going to have a significant impact in the financial services industry and are going to significantly transform the industry (Chen and Robinson, 2019).

1.3. BACKGROUND TO THE RESEARCH PROBLEM

Disruptive innovation is considered one of the most influential theories that drive economic growth through discoveries of new ways of doing business that surpass the conventional ways (most of the time). Innovations contribute to organisations' ability to improve their services, products, efficiency, and customer experience and help organisations expand beyond their established markets. Nevertheless, there is still a serious need for more profound and analytical research on this theory in business leadership, management, and strategy (Christensen et al., 2017). Si et al., (2020) and Williamson et al. (2020) agree and add that over the last two decades many studies have focused on investigating disruptive innovation in the developed economies, with little focus in emerging markets (Nejad, 2022) such as South Africa.

Even though this concept has gained value among business leaders, managers, and academics, the core concepts relating to its impact in some industries (Christensen et al., 2017) such as the financial services industry still need to be understood (Cai, 2018). There is a business and scholarly knowledge gap in realistically understanding the application and impact of disruptive technologies such as fintechs in the economy and how industries like financial services can understand and use technological innovations as a competitive strategy (Cai, 2018; Drasch, Schweizer and Urbach, 2018). Liu, Li and Wang (2020) agree and argue that despite the recent focus on fintech, research on the overall fintech business model and analysis is lacking.

Academically, economically, and financially, it is essential to close these research gaps to increase the body of knowledge about these technologies (Drasch, Schweizer and Urbach, 2018). Cai (2018) and (Varga, 2017) agree and suggest that there is a serious need to conduct thorough business management and leadership studies related to fintechs to close the knowledge gaps. Palmié et al. (2020) shares the same sentiment and argue that a broader perspective in the study of technological innovations and fintechs is needed. Cai, (2018) further suggests that it is essential to investigate how incumbents respond to the challenges brought by fintechs and whether and to what extent the fintech new entrants affect financial services. Drasch, Schweizer and Urbach, (2018) opine that thorough research will also help with understanding how the collaborations of incumbents with fintechs will reshape the financial services industry and the entire economies because the relationship between fintech organisations and the incumbents is yet to be understood (Turcan and Deák, 2021).

Furthermore, after the global financial crisis in 2008 and the emergence of the fintech market, there was a need for more strict regulation of the financial services industry. Ever since the regulators are under pressure to identify new regulatory limits that accommodate fintech so that financial organisations can operate and manage their risks while not stifling innovation. Things like cybersecurity, protection of client information and prevention of money laundering are sitting at the top of the regulatory agenda compliance. Coetzee (2018) reiterates this and posits that it is essential that regulators increase their efforts to enforce compliance and prevent regulatory uncertainty. The South African Reserve Bank (SARB) acknowledges that there is a direct proportionality between regulatory risks and fintech because as fintech increases, chances of poor oversight also increase (South African Reserve Bank, 2018a). It is in the wake of these challenges that Coetzee (2018) questions whether the regulatory environment is empowered enough to regulate fintechs. This is emphasised by Cortez (2014) and Xu, Tang and Guttman (2019) in their argument that it is still unclear how to regulate these innovations because some of them fall beyond the conventional regulatory framework. To ensure a stable financial industry, it is crucial for regulators to understand the impact of fintechs on financial services regulation and the risks that these new technologies introduce. By doing so, regulators can assess whether the current regulatory framework is sufficient in addressing these risks and maintaining industry stability. Failure to comprehend the impact of fintechs on regulation could lead to an unstable industry, which in turn would create opportunities for fraudsters and other criminals to take advantage of regulatory loopholes and harm consumers. Ultimately, a better

understanding of fintech's impact on regulation will lead to improved regulation and a safer financial industry for all.

With all the developments in the financial services industry, there is huge business leadership and scholarly interest in investigating the impact of fintechs in the financial services industry, especially in the developing world because their implications have not been sufficiently studied. There is also an interest in understanding if fintechs provide the financial services industry with new sustainable growth opportunities (Cai, 2018; Chen and Robinson, 2019; Zvirgzdina and Skadina, 2019). In addition, it is critical to investigate how incumbents respond to the challenges posed by fintechs and whether and to what extent new fintech entrants affect financial services (Gilbert and Bower, 2002; Charitou and Markides, 2003; Fenwick and Vermeulen, 2017). Furthermore, to ensure the credibility and sustainability of the financial services industry, it is imperative that regulators define new ways to regulate fintechs (Coetzee, 2018). Having a comprehensive knowledge of the impact of fintechs is crucial for industry leaders, especially incumbents and regulators, as it will enable them to react appropriately and minimise any negative impact on their organisations and the industry. This will help incumbents to identify ways to address disruptions and safeguard their market share. On the other hand, a lack of understanding could result in incumbents and regulators responding poorly and hastily, leading to wasted resources and unsuccessful outcomes. Additionally, if incumbents fail to act, they run the risk of losing market share to more innovative fintech companies and becoming obsolete in the industry.

The poor fintech adoption is a major concern for financial institutions that have invested significant resources in this area. If adoption rates do not improve, the significant investments made in fintech could potentially be rendered futile. Therefore, it is crucial for these institutions to comprehend the factors that affect consumers' decision-making regarding fintech adoption. To achieve this, financial institutions are exploring innovative methods to encourage customers to adopt fintech solutions. By comprehending the factors that influence consumer adoption of fintechs, financial service providers can develop effective behaviour change strategies to enhance adoption rates.

1.4. PROBLEM STATEMENT

The impact of financial technologies has not been sufficiently studied in the developing world. In addition, it is critical to investigate how incumbents respond to the challenges posed by financial technologies and whether and to what extent new financial technology entrants affect financial services (Cai, 2018). South Africa, as a developing country, is experiencing the increase in financial technologies. This has implications for the financial services industry and the entire South African economy (Mungai and Bayat, 2018). It is also important to understand the views of consumers and the extent to which customers are adopting financial technologies (Savi and Peterac, 2019), which has been found to be significantly poor, especially in the developing economies despite huge investments by the financial institutions (Yu, 2012; Gunawan, Sinaga and WP, 2019) .

1.5. RESEARCH AIM AND QUESTIONS

According to the Oxford dictionary impact is a marked effect or influence. Therefore, it refers to the influence of an action or phenomenon on something. In the context of this research, the 'phenomenon' is financial technologies, and 'something' is the financial services industry in South Africa.

This research aimed at investigating the disruptive impact of financial technologies on the financial services industry in South Africa, and the primary research question is what is the impact of financial technologies on the financial services industry in South Africa?

The study intended to realise this aim by answering the following questions:

1. What is the impact of fintechs on the financial services industry in South Africa?
2. How do traditional financial institutions and regulators respond to fintech disruptions in South Africa?
3. What are the factors that influence customers to use fintechs (such as a digital-only bank) in South Africa?
4. Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

1.6. RESEARCH OBJECTIVES

The research objectives of the study are as follows:

1. To explore the impact (challenges and benefits) of fintechs such as digital-only banks in the financial services industry in South Africa.
2. To investigate incumbents' and regulators' strategic realignment to fintechs disruptions in South Africa.
3. To investigate the factors influencing consumers to use financial technology such as digital-only banks in South Africa.
4. To determine if the COVID-19 pandemic has impacted the adoption of fintechs in South Africa.

1.7. RESEARCH METHODOLOGY

This research adopted pragmatism philosophy, used inductive approach whereby the research began by the collection of data relevant to the topic. Once a substantial amount of data had been collected, the researcher started data analysis. Mixed methods were used to draw benefits from both qualitative and quantitative research. The research was based on a combined research design that tapped into the benefits of explorative and evaluative research designs. Phenology research methodology was used as it enabled the researcher to understand the meaning according to the lived experiences of the research participants. This allowed the researcher to gain a more in-depth understanding of the characteristics of the phenomena being studied.

The researcher conducted semi-structured interviews. Because data were collected during the period of strict COVID-19 restrictions, all interviews were conducted virtually to comply with COVID-19 social distancing protocols as prescribed by the World Health Organisation and the Department of Health in South Africa. Purposive non-probability sampling method was used to select interviews participants from incumbent financial, fintech and regulatory institutions. Probability sampling was used to choose respondents for the questionnaires which were used to supplement and confirm the findings from the interviews for triangulation purposes and to develop the fintechs adoption framework. These respondents were bank customers and managers from different financial institutions.

1.8. DELINEATION OF THE STUDY

This study centred on the financial services sector in South Africa, specifically exploring the impact of financial technologies and the reasons behind their slow adoption by consumers.

1.9. SIGNIFICANCE OF THE STUDY

This research delves into how fintechs affect various stakeholders in the financial services industry. It intends to pinpoint ways to minimise negative impact and maximise positive ones, ensuring the industry's long-term viability. By exploring proactive strategies, this study proposes techniques for incumbent organisations to stay competitive and benefit consumers. Additionally, it recommends proactive measures for regulators to modify their framework to incorporate fintechs. The research also identifies factors that hinder fintech adoption in developing economies and devises a framework to enhance adoption. Without a systematic approach, the financial services industry faces significant threats. This study's findings and frameworks developed aim to ameliorate these challenges and create a secure and thriving ecosystem in the sector.

1.10. THESIS OUTLINE

This thesis has two focus areas and six chapters. Focus area one deals with the impact of fintechs on the financial services industry and focus area two deals with adoption of fintechs by consumers. The chapters of the research are as follows:

Chapter 1 Introduction

Chapter 1 introduces the topic and the study. It provides the background of the topic studied. It also outlines the research problem, aim of the study, research objectives, research questions and significance of the study. This chapter also provides the outline of the thesis.

Chapter 2 Literature review

This section of the research delves into the literature review, starting with a contextual background. It focuses on the financial services industry in South Africa, examining the different phases that have shaped it. These include the impact of world economic growth in the

second half of the nineteenth century, the transition to a democratic government, and the rise of fintechs and disruptive technologies.

The chapter then explores the theoretical foundations of the research and relevant literature on fintechs, discussing common types of fintechs, their impact on the financial services industry, and the main drivers of fintech evolution. It also examines the impact of the COVID-19 pandemic on the industry and covers response strategies used by financial services institutions and regulators to mitigate negative effects. Finally, the chapter addresses consumer adoption of fintechs, popular technology acceptance models, and concludes with the conceptual framework of the research.

Chapter 3 Research methodology

This chapter details the research methodology used to carry out the study. It deals with the research philosophy, approach, purpose of the research design, research strategy, techniques and procedures and data analysis methods used to answer the research questions.

Chapter 4 Research findings

Chapter 4 presents the research findings of focus one of this study, i.e., the impact of fintechs on the financial services industry and focus two of this study, i.e., the adoption of fintechs by consumers.

Chapter 5 Discussion of findings

Chapter 5 is the discussion of the research findings and the presentation of the frameworks.

Chapter 6 Conclusions and recommendations

Chapter 6 summarises the thesis, look at whether the research objectives were achieved, provides recommendations from this research, contributions of the thesis, limitations of this study, and suggestions for future research.

1.11. CONCLUSION

This chapter introduced the research topic and the study and detailed the research problem, aim, objectives, and questions. It also provided the significance of the research and ended with the thesis outline.

The following chapter discusses the relevant literature related to the studied phenomena. It begins with the context of this research and then delves deep into the changes in the financial services industry worldwide.

CHAPTER 2 LITERATURE REVIEW

2.1. INTRODUCTION

In the past few years, several industries have been experiencing significant transformational changes. These changes stem from organisations' need to improve and provide better services and products. Several authors, including Karl Marx, Joseph Schumpeter, and Clayton Christensen, wrote about industry changes essential for economic growth and development decades ago. Marx's theory of economic development, first published in the mid-1800s, argues that "the bourgeoisie cannot exist without constantly revolutionising the instruments of production" (Karl, Marx and Engels, 2008:38). This was followed by Schumpeter's theory of economic innovation, the creative destruction theory, which asserts that industrial transformations continuously revolutionise economies by destroying the old while creating the new (Schumpeter, 1943). These theories laid a foundation for Clayton Christensen's theory of disruptive innovation, which asserts that innovative technologies cause transformative changes in industries (Christensen, 1997).

In the financial services industry, industry transformations have resulted in the wild use of technology to improve financial products and services. This combination of technology and financial services has been termed financial technology (fintech).

This study is, therefore, based on technological innovations in the financial services industry. It talks about how these innovations are shaping the industry. The study examines some critical aspects of these technological innovations, namely:

- The rise of the fintechs and the most common fintech types that significantly transform this industry.
- Key drivers of the fintechs.
- Impact of fintechs in the financial services industry.
- Responses to fintech disruption by incumbent financial institutions and financial services regulators.
- Adoption of fintechs by consumers.

These aspects are essential in understanding the role that fintechs play in the financial services industry and the economy and answering the central question of this research, namely, what is the disruptive impact of financial technologies on the financial services industry in South Africa?

Even though fintechs and their impact on the financial services industry have been studied, most studies have been conducted in developed economies (Si et al., 2020; Williamson et al.,2020), with only a few studies conducted in emerging economies (Nejad, 2022). Therefore, this study aimed to close this gap by investigating the impact of fintechs in an emerging economy, South Africa.

The following sections discuss the financial services industry with a focus on the South African financial services industry- the research context, a synopsis of innovation, and theories relevant to this study- creative destruction theory, Marxian theory, and disruptive innovation theory. This is followed by a discussion of the evolution of the financial services industry, an overview of financial technologies, and a discussion about the rise of fintechs. Subsequent sections discuss critical elements of the fintech evolution, such as fintech drivers, the impact of fintechs, responses to fintech disruption, and consumer adoption of fintechs. The chapter ends with the conceptual framework proposed for this study.

2.2. THE FINANCIAL SERVICES INDUSTRY

The financial services industry comprises companies involved in various financial activities such as retail banking, commercial lending, insurance, credit cards, mortgage banking, brokerage, investment advisory, and asset management (Hatzkis, Nair and Pinedo, 2010). This industry plays a crucial role in the economy, and its collapse in 2008 severely impacted the global economy. Before the crisis, the industry boasted strong corporate stability and provided a safe workplace for many employees. However, following the crisis, the industry's reputation suffered, and there was a growing concern about its systems (Buckley, Arner and Barberis, 2016; Gomber et al., 2018). The industry has undergone significant changes in recent years, driven primarily by technological innovations such as automation (Brătăşanu, 2018), evolving customer expectations, and evolving regulatory environment (Galaski, 2015).

Although these advancements have generated excitement among many industry players (Elsaid, 2021) and have significantly improved consumers' lives by revolutionising financial transactions and enhancing customer experience (Museba, Ranganai, and Gianfrate, 2021; Nejad, 2022), they have also raised concerns and caused disruptions in processes (Gomber et

al., 2018). Galaski (2015) and Anagnostopoulos (2018) share these concerns, arguing that these advancements create a new dimension in the industry, characterised by threats such as regulatory uncertainty and intense competition for incumbents' businesses. These changes have pressured industry leaders, including incumbents and regulators, who must consider the implications for their companies and the industry (Galaski, 2015).

2.3. SOUTH AFRICA- THE FINANCIAL SERVICES INDUSTRY CONTEXT

Over time, South Africa's financial services industry has undergone significant changes, much like the rest of the world. This industry played a crucial role in developing the country's unequal economy during the apartheid era from 1948 to 1993. Despite this, South Africa's financial services industry is comparable to those of the BRIC nations, which include Brazil, Russia, India, and China (Mboweni, 2004; Mlambo and Ncube, 2011). The industry's evolution has been influenced by historical events, resulting in three distinct phases of development driven by factors such as global economic growth, democracy, technological advancements, and fintechs (Mckenzie et al., 2015). Further details on these phases are discussed in the following section.

2.3.1. The first phase of development- World economic growth

The global economy saw significant growth in the latter half of the 19th century, and South Africa was no exception. Between 1850 and 1914, international trade skyrocketed from $1 billion to $88 billion, with more peripheral areas being drawn into the expanding North Atlantic core's economic orbit (Jones, 1994). South Africa was one such area that rose to the occasion, first by producing wool and later by discovering minerals, beginning with diamonds in Kimberly in 1870 (Jones, 1994; Mckenzie et al., 2015). These events were pivotal in laying the foundation for South Africa's financial system. It all started in 1823 when the Cape Colony (now Western Cape, Eastern Cape, and Northern Cape) allowed privately incorporated banks to operate. The colony's agricultural success and external trade demand led to the formation of the first banks, with twenty-eight operating by the early 1830s (Verhoef, 2011; Mckenzie et al., 2015). During this time, smaller banks catered to local needs, but rapid growth in the 1850s paved the way for the establishment of large imperial banks in 1861 (Jones, 1994; Mckenzie et al., 2015).

In 1860, The London and South Africa Bank became the first of the imperial banks, followed by Standard Bank in 1862. Unfortunately, bank crises in the Cape Colony between 1865 and 1890 resulted in the demise of all local independent banks, except for British banks such as Standard Bank and the Bank of Africa, which were established in 1880 from the remnants of the Oriental Banking Corporation. By 1890, the number of banks had risen to seven (Verhoef, 2011).

The Natal Bank was founded in Natal (now KwaZulu-Natal) in 1854, followed by the establishment of Standard Bank and the London and South Africa Bank. Cape banks expanded into the Republic of Orange Free State (now Free State), and Bloemfontein Bank was opened in 1862. Oriental Banking Corporation received a license to operate in the republic in the late 1870s and was later absorbed into the Bank of Africa in 1880. Standard Bank extended operations to the Republic of South Africa, which includes Gauteng, Limpopo, Mpumalanga, and North-West in the modern South Africa. The Netherlands Bank of South Africa was established in 1888, and in 1890, the National Bank, supported by financiers from London, Amsterdam, and Berlin, was formed (Verhoef, 2011).

The banking industry in South Africa underwent significant changes following the Union of South Africa formation in 1910. The National Bank of South Africa acquired the Natal Bank, the National Bank of the Orange Free State, and the Bank of Africa, while the Standard Bank acquired the African Banking Corporation. Later, in 1926, Barclays Bank (Dominion, Colonial, and Overseas) acquired the National Bank (Verhoef, 2011).

In response to the Imperial banks' supremacy, Volkskas was established in 1934 to consolidate Afrikaner economic power. The Imperial Banks held a 90 percent stake in the banks of South Africa by 1910 due to their conservative bank management practices and size. Four foreign-based banks operated in South Africa during this period, including Standard Bank, Bank of Africa, the Banking Corporation, and the Netherlands Bank (SA History Online, 2020).

The dominance of the Imperial banks continued until the 1970s, with Standard Bank, Barclays Bank DC & O, the Netherlands Bank, and Volkskas dominating the banking sector. However, the status quo changed slightly in the late 1970s (Verhoef, 2011).

Over the years, the banking needs of people have evolved from simply safeguarding their money to include other requirements such as housing finance. This shift in conditions led to the formation of societies like Saambou, United, SA Perm, and Natal Building Society (NBS) that offered long-term financing for housing and other luxuries. By the early 1980s, the banking industry was dominated by five major banks - First National Bank Group (FNB), Standard Bank, Nedcor, Bankorp, and Volkskas. In 1991, Allied Bank, Trust Bank, United Bank, and Volkskas Bank merged to create the Amalgamated Bank of South Africa (ABSA) (Singh, 2004). Although the emergence of new banks brought about some changes, it did not significantly alter the banking ecosystem (Verhoef, 2011).

2.3.2. The second phase of development- Democracy

Back in 1995, the financial services industry in South Africa underwent significant structural changes. These changes included an increase in the number of participants, a shift in product offerings and service delivery, and regulatory adjustments. The impetus for these changes was the political transformation that occurred in South Africa, which brought about democratisation and economic liberation. As a result, financial service institutions had to expand their services to cater to a considerable number of South Africans who had previously been excluded from formal financial provision (Hawkins, 2004). The outcome of these modifications was an increase in the number of individuals who could access financial services, as illustrated in Table 2-1.

Table 2-1 Percentage population with access to financial services between 1995 and 1999 in South Africa (adapted from Hawkins 2004)

All LSM groups	ATM card	Cheque account	Credit card	Loan	Savings account
1995	22,8%	9,1%	5,3%	3,2%	38,2%
1996	24,9%	9,6%	5,5%	3,2%	37,7%
1997	25,7%	9,4%	5,3%	2,3%	35,8%
1998	25,5%	9,0%	5,1%	3,0%	38,5%
1999	31,8%	8,9%	5,2%	3,0%	37,0%
Average	26,1%	9,2%	5,3%	2,9%	37,4%

Note: LSM = Living Standard Measure.

From 1994 to 2001, the banking industry was dominated by five major banks: ABSA, Standard Bank, Nedbank, First National Bank, and Investec, which held 87 percent of the market share. However, by 2001, their market share had decreased to 75 percent, losing 12 percent to smaller banks that had carved out a niche for themselves in the industry (as shown in Table 2.2) (Hawkins, 2004). The number of banks also decreased sharply (by over 28 percent) between 2001 and 2002. This was due to various reasons, including the acquisition of smaller banks such as Imperial Bank, Mercantile Lisbon, and McCarthy Bank by larger banks as part of the industry's consolidation. Some smaller banks, like Regal Treasury Bank and Saambou, dissolved due to poor financial management. On the other hand, African Merchant Bank, Brait Merchant Bank, Cadiz Investment Bank, and Corpcapital Bank did not apply for license renewal in 2002, as maintaining their banking licenses was no longer a financially viable option (Hawkins, 2004).

Table 2-2 Market share of assets of major banks in South Africa between 1994 and 2001 (adapted from Hawkins, 2004)

Expressed as % of total assets	1994	1998	2001	% change 1994–2001
ABSA	29	23	19,3	− 33,4%
Stanbic	21	19,5	17,6	− 16,2%
First National Bank	19	14,4	18,7	− 1,6%
Nedcor	15	15,7	13,8	− 8,0%
Other (including BOE)	12	18,1	16,9	40,8%
Investec	3	5,1	6	100,0%
Foreign	1	4,2	7,7	670,0%
TOP 4	84	72,6	69,4	− 17,4%
TOP 5 (plus Investec)	87	77,7	75,4	− 13,3%
Share of others and foreign	13	22,3	24,6	89,2%
Total share	100	100	100	

In 2001, Capitec Bank was established, bringing significant changes to South Africa's financial services. Their innovative banking models disrupted the industry and targeted the lower end of the market, reducing banking fees through technological advancements (Fourie, 2016). Capitec's customer-centric business model included extended operating hours, with some branches open until 18:00 on weekdays, 13:00 on Saturdays, and even Sundays, providing convenience to banking customers. As a result, Capitec quickly became the fastest-growing bank in South Africa.

By 2018 Capitec had surpassed the 'traditional big four banks' and became the largest bank in South Africa, with roughly 9.17 million customers using it as their primary bank. ABSA followed in second place with 5.06 million, trailed by FNB with 5.01 million, Standard Bank with 3.97 million, and Nedbank with 3.36 million. Capitec's dominance has continued to increase. According to Businesstech (2023), by June 2023, Capitec customer base had increased to 20 million customers, Standard Bank- 18,2 million, FNB- 10,96 million, ABSA- 9,6 million and Nedbank- 7,4 million (Figure 2-1).

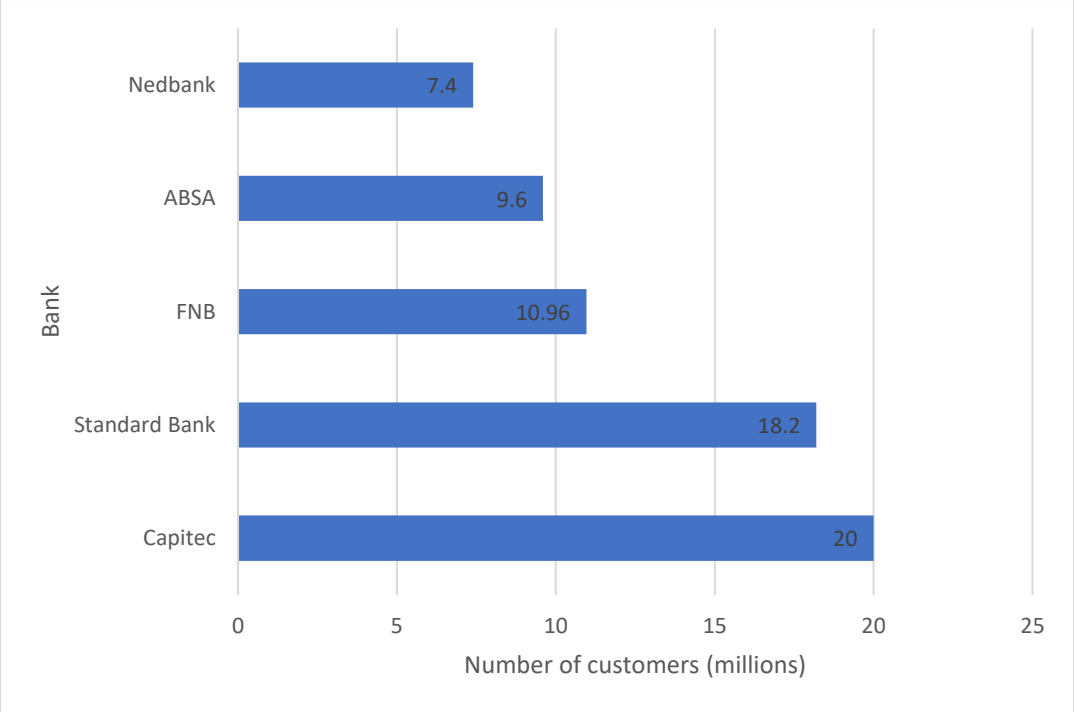


Figure 2-1 South Africa's leading banks (author's creation, 2023)

2.3.3. The third phase of development- Fintechs and technological innovations

Social media, mobile phones, artificial intelligence, big data, and the Internet of Things have brought about a digital revolution that has transformed organisations' business models and value propositions across various industries, including the financial services sector (Mungai and Bayat, 2018). In financial services, these technological advancements have led to the emergence of financial technologies that have significantly enhanced the industry, improving distribution speed and access to capital (Hutton et al., 2019). Fintech has made the financial sector more inclusive, extending its services to previously underserved and neglected groups. These developments have eliminated traditional barriers to access, such as geographical constraints and high costs (Mungai and Bayat, 2018).

During the early 2000s, mobile phone usage in South Africa increased significantly. By 2002, the country had 13 million mobile phone subscribers (Brown et al., 2003). This growth and increased internet usage created new opportunities for the financial services industry. As a result, major banks began exploring mobile and internet banking options (Brown et al., 2004; Singh, 2004). ABSA was the first to introduce internet banking in South Africa with 'freenet' in 1996. Though initially slow to catch on, customers appreciated the convenience, security,

and affordability of online banking. Nedbank soon followed suit, with Standard Bank, First National Bank, and Mercantile Bank just behind (Singh, 2004). However, in June 2002, ABSA discontinued ‘freenet’ and launched a new platform which provided e-procurement services, customer relationship management (CRM) and served as a platform for small and medium-sized enterprises. Standard Bank introduced foreign exchange, share trading, international banking services, and encrypted email statements that only customers could access. They also allowed customers to open, manage, and modify their investment accounts online. In response, FNB partnered with Commerce One to offer e-procurement services and promote local and international trade (Singh, 2004).

The financial services industry in South Africa has been facing a lot of pressure to adapt to new technologies, as evidenced by the changes made by traditional banks. To keep up with these innovations, banks must ensure that their infrastructure is flexible and adaptable (Camarate and Brinckmann, 2019). The evolution of financial services in South Africa since 1996 is captured in Figure 2-2, which shows how non-banking institutions like Discovery have penetrated this industry. In response, banks like ABSA have announced digital banking strategies. Other significant developments include Old Mutual teaming up with Bidvest Bank to launch the Old Mutual money account, FNB launching a mobile banking unit for rural communities, and Postbank and Tymebank receiving provisional licenses from SARB. U bank also launched its digital payment platform, and PEP stores introduced PEPplus debit cards. Standard Bank acquired a majority stake in SnapScan, and the formation of the Human Settlement Development Bank. Capitec launched its credit card in 2017, and Bank Zero was registered with SARB in 2018 (Camarate and Brinckmann, 2019). Tymebank and Discovery Bank were established in 2019, and Bank Zero opened for public access in August 2021 (Businesstech, 2021).

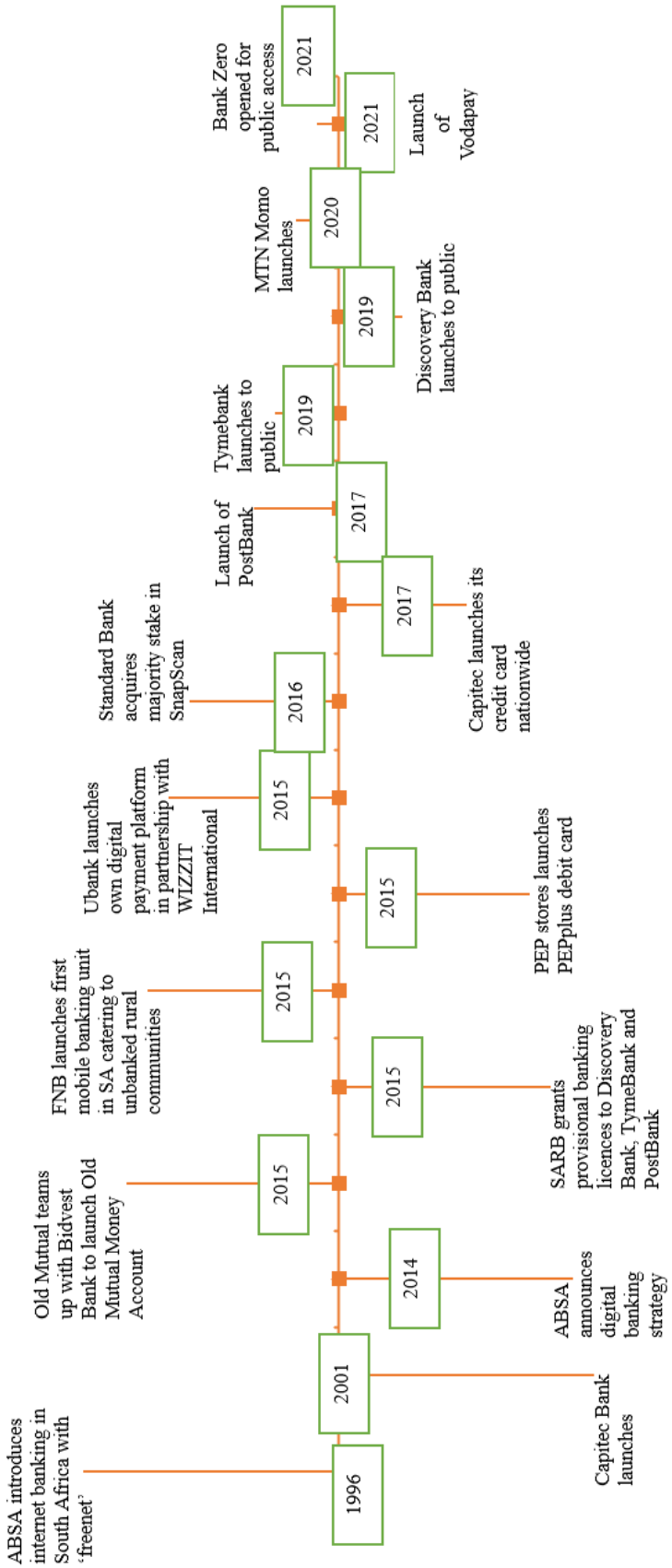


Figure 2-2 Major developments in South African banking from 1996 to 2021 (Author's creation, 2023)

The banking industry in South Africa is undergoing a transformational phase, with significant changes that could impact traditional banks, according to Camarate and Brinckmann (2019). Three trends in the South African banking services industry could amplify this impact, including the emergence of digital solutions with lower-cost models launched by new or non-traditional financial services organisations like Discovery, the emergence of sector and industry-specific banks tightly integrated with broader supply chains established by non-financial services organisations like the South African Post Office, and the major banks' ongoing transformation to address changing customer, regulatory, and technology needs.

Thanks to disruptive innovations and financial technologies, banks can now offer their services through various technological innovations such as internet banking, mobile phone banking, and digital banking, which are less costly than traditional approaches (Laukkanen and Pasanen, 2008; Auta, 2010). However, these trends also affect the profitability of conventional banks and the entire financial services industry in South Africa, which has historically been profitable (Mlambo and Ncube, 2011; Camarate and Brinckmann, 2019). This is shown by the fluctuations in the return on equity of the South African banking industry over the last decade. While there was an upward trend from 2013 to 2016, the trend reversed from 2016 onwards, with the most significant decline in 2020. However, it is worth noting that both 2021 and 2022 have seen an increase in return on equity after the poor showing of 2020 (Cowling, 2023) (Figure 2-3). As new entrants such as technology companies, telecommunication companies, and online retailers infiltrate the financial services industry and tap into what has been considered 'banking activities' in a disruptive manner, there is uncertainty regarding whether banks will remain profitable in the future. The financial services industry will never be the same again (Mungai and Bayat, 2018). Auta (2010) warns that incumbent financial institutions must take these changes seriously. Those who fail to adopt these contemporary trends or adapt to the changing landscape are likely to lose their customers and be displaced.

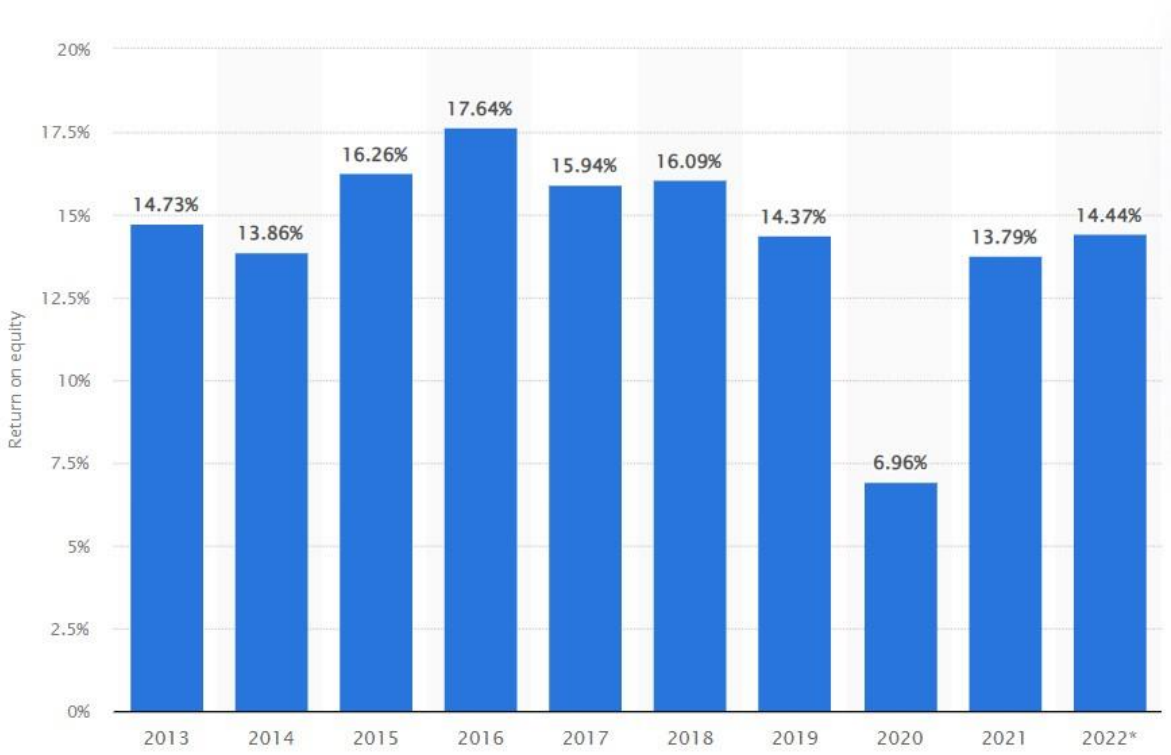


Figure 2-3 Return on equity of the banking industry in South Africa from 2013 to 2022 (adapted from Cowling, 2023)

2.4. INNOVATION

The pace of technological advancements is currently at an all-time high, permeating all aspects of society and human activity. As a result, there are significant changes taking place across various industries and the world at large (Mpofu and Nicolaides, 2019). This rapid pace of technological change is having a disruptive effect on the global economy. The internet has enabled unprecedented connectivity between various devices, necessitating that people worldwide rely more heavily on digital tools to manage their daily tasks. Technology has allowed people to do things they never previously thought possible. They can now interact with their cars to navigate them to new destinations and instantly book hotels, flights, and cabs with the click of a button. People can directly transfer funds to relatives in far-flung areas and pay for goods by tapping their phones on speed points (Wagner et al., 2016). While advancements in technology have the potential to improve people's lives significantly, those residing in developing countries often do not receive the benefits. This is mainly due to inadequate infrastructure hindering access to these technologies.

These technologies are also impacting different stakeholders such as incumbent businesses (Yanagawa, 2018), regulatory (Tsindeliani et al., 2022) and humans negatively in many ways, including replacing humans in many jobs (Dirican, 2015; Wang et al., 2019). They introduce new business models that challenge traditional business methods, increase competition for the incumbents and force them (incumbents) to adapt; otherwise, they risk losing their competitive advantage in the market (Hornuf and Haddad, 2019). These technologies also introduce new regulatory risks into the industry because sometimes the current traditional regulations' scope does not include them (Yanisky-ravid and Hallisey, 2019). Many individuals have legitimate concerns regarding the potential negative impact of advanced technologies on their jobs. The fact that these technologies can replace human workers is often a point of contention. Therefore, it is essential to thoroughly assess the long-term effects on industries before introducing such technologies. This could entail conducting a comprehensive impact analysis to identify and address any potential adverse consequences.

Innovation is the driving force behind these numerous technological advancements. Innovation can be defined as the introduction of new ideas, things, or methods of doing something. In the world of business, innovation refers to the implementation of new ideas, the development of dynamic products or services, or the enhancement of existing ones. As reported by Boratyńska (2019), innovation involves a multi-stage process where an organisation transforms ideas into new or improved products, services, or processes to stay competitive in the market. The innovation aims to create better and more effective processes or services. This definition aligns with that of Christensen (1997), who defines innovation as any changes in processes that enable an organisation to turn capital, production, and materials into a high-value product or service. This also includes new business models that can bring about changes in processes.

While it may seem incredible, it is essential to approach claims about the benefits of innovations with caution since they do not always lead to positive outcomes (Lerner and Tufano, 2011). Some economists believe that the economy is negatively impacted by financial innovations, particularly new financial products and that they are responsible for the emergence of the global financial crisis (Barna, Nachescu and Dumbravenu, 2013). Adrian and Shin (2010) are among the scholars who support this notion and attribute the 2008 global financial crisis to innovations. Their research indicates that a surge in innovation resulting from funding constraints preceded the onset of financial crises. Levitin (2009) contends that certain innovations expose economies to risk by promoting unsafe lending practices. Due to unsafe

lending, the lenders can lose vast amounts of money when the borrowers cannot repay their loans. Additionally, it has been observed that certain innovations are being marketed with misleading claims, which can increase the risk for investors beyond their expectations (Krugman, 2007). Meanwhile, Christensen (1997, 2000, 2021) and Mauborgne and Kim (1999) argue that innovations positively impact industries by enhancing products, services, and customer experience. However, some experts like Mishra (2010) and Schinckus (2020) believe that innovations have both benefits and drawbacks.

Innovation is entering various industries worldwide, but the financial services industry is remarkably poised for disruption. In this industry, the need for physical cash transactions is decreasing with the rise of digital financial platforms and e-commerce websites. The wealth of data generated from these platforms is transforming the economy and creating new possibilities for the financial services industry (Wagner et al., 2016). Although the COVID-19 pandemic and geopolitical tensions have recently impacted the financial services industry, it remains a promising area for innovation and change (Goyal et al., 2023). Hence this study focused on innovations in the financial services industry.

2.5. THEORIES

The theoretical framework of this study is based on the theories of disruptive innovation, creative destruction, and Marxian theory. The theory of disruptive innovation was developed by studying previous technological advancements (as depicted in Figure 2-4), beginning with Schumpeter's theory of creative destruction. Christensen popularised this theory in his book, "The Innovator's Dilemma", which was published in 1997. Today, it is a widely recognised and accepted model of innovation. Schumpeter derived the theory of creative destruction from Marxian theory. These three theories are crucial in innovations and uncovering new products, services, and business models which are essential for organisations' survival. Organisations are often inspired to innovate to improve and stay competitive, much like the theory of natural selection in biology which states that organisms that are better adapted to their environment are more likely to survive (Christensen and Raynor, 2003). The theories are discussed in the subsequent section.

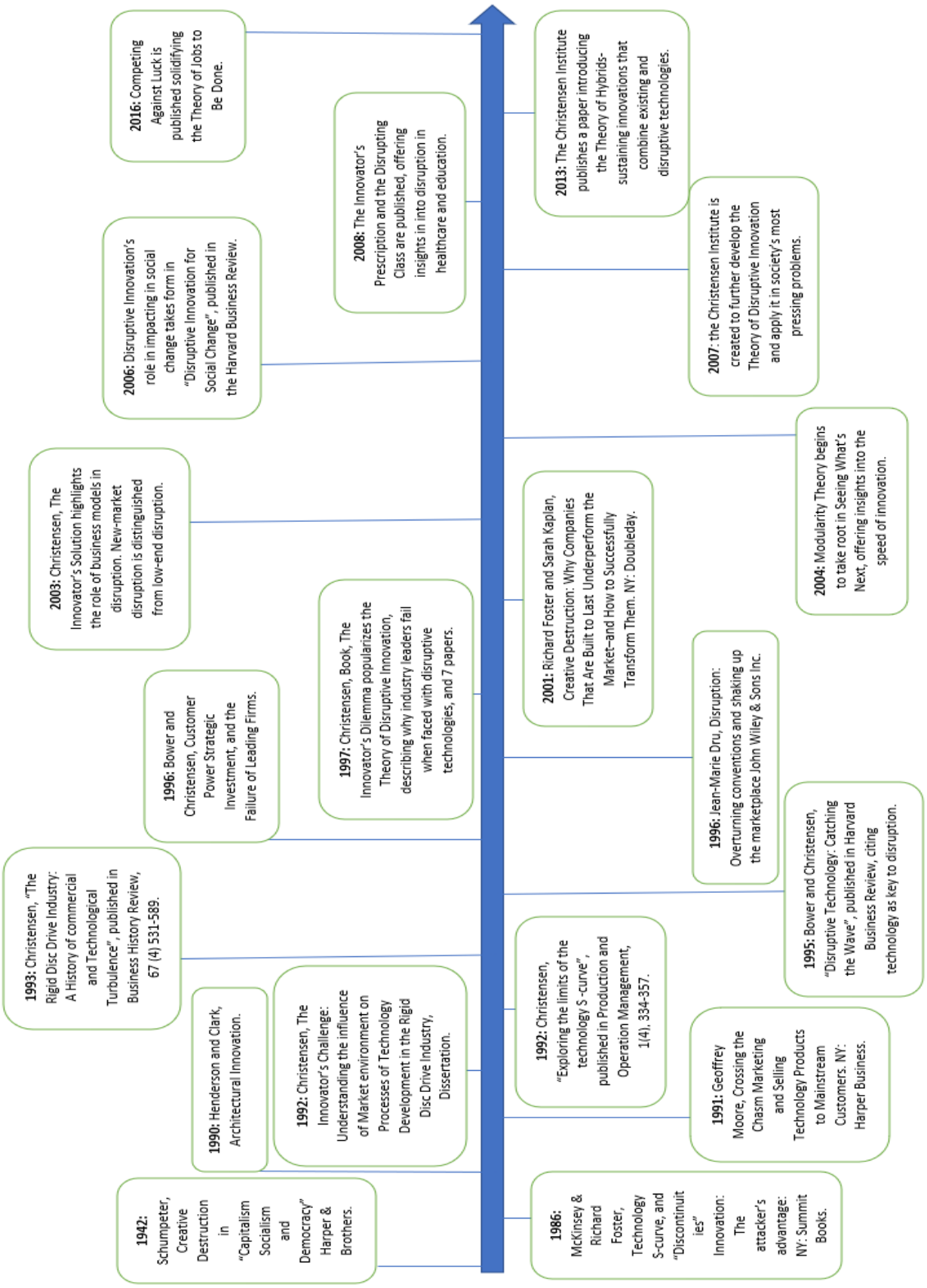


Figure 2-4 Evolution of Disruptive theory (author's creation, 2021)

2.5.1. Creative Destruction and Marxian Theories

Schumpeter introduced the concept of creative destruction in the 1940s, inspired by Karl Marx's works. Schumpeter popularised it as a theory of economic innovation and business cycles (Zwick, 2018). Creative destruction is the process of continuously transforming the industrial structure from within, replacing the old with the new (Schumpeter, 1942). Nightingale (2015) characterises this as an evolutionary process, where new players creatively disrupt the existing order, leading to radical changes that eventually become the norm, establishing a new status quo. This cycle can then be repeated, enabling new players to initiate innovation.

The concept of creative destruction differs from Marx's theory on the accumulation and destruction of wealth under capitalism. Marx's theory encompasses a broader scope, including the linked wealth accumulation and destruction processes. In accord with Marx, "The bourgeoisie cannot exist without constantly revolutionising the instruments of production, and thereby the relations of production, and with them the whole relations of society. On the contrary, conserving the old modes of production in unaltered form was the first condition of existence for all earlier industrial classes. Constant revolutionising of production, uninterrupted disturbance of all social conditions, everlasting uncertainty and agitation distinguished the bourgeois epoch from all earlier ones. All fixed, fast-frozen relations, with their train of ancient and venerable prejudices and opinions, are swept away; all new-formed ones become antiquated before they can ossify" (Karl, Marx and Engels, 2008:38).

In accordance with Marx, capitalism drives material production forward by constantly innovating and advancing technology, leading to revolutionary changes that bring about new winners and losers (Zwick, 2018). Marx believed that capitalism thrives on creative destruction, which involves disrupting previous economic orders and devaluing the status quo to make way for new forms. In contrast, Schumpeter's theory emphasises how new entrants bring radical innovation and new products, making existing products and technologies obsolete (Bureau, 2013). These forces established companies to adapt and avoid being replaced by innovative newcomers (Zhou, He and Zhu, 2017).

Companies that bring innovation to the market, often new players, have the potential to improve existing products and gain an advantage over their competitors (Garcia-Macia, Hsieh and Klenow, 2019). These new entrants are the driving force behind economic growth, even though they may displace established players, as noted by Schumpeter (1942), due to the inability of incumbents to adapt to changing technologies and markets (Bower and Christensen, 1995). History has shown that significant advancements in innovation have been preceded by disruptive economic transformations, such as the rise in production that occurred towards the end of the Great Depression in the 1930s (Finlayson and Peacock, 2021).

Although creative destruction can be brutal for established companies (incumbents), it also presents opportunities for new startups (Zwick, 2018) and is considered a crucial factor in economic development (Aghion et al., 2019). Laidler (2017) suggests that startups are often viewed as agents of change in the economy, bringing new and innovative ways to improve existing products and services established companies offer.

The concept of creative destruction aims to enhance productivity, but at times, it fails to generate growth, and the output may only sometimes be superior (McMillan, 2005).In the manner of Komlos (2016), the destructive element of innovation is increasing compared to the creative part, as modern technologies tend to produce products or services that are like the ones they replace, leading to a significant depreciation in their value during the destruction process. Garcia-Macia, Hsieh, and Klenow (2019) support Komlos (2016) and assert that most growth arises from established companies focusing on improving their existing products rather than creating new ones. They argue that the progress of incumbents is more crucial than creative destruction, although it plays a vital role in driving economic growth. Their research shows that creative destruction accounts for only about 25 percent of development, with the majority coming from other improvements that companies make to their products and services.

2.5.2. Disruptive innovation theory

Bower and Christensen first introduced the concept of disruptive innovation in a 1995 article published in the Harvard Business Review. Further development on the subject was made in Christensen's book, "The Innovator's Dilemma", released in 1997. As reported by Bower and

Christensen, disruptive technologies possess different attributes from traditional technologies, which mainstream customers highly value in the market. However, these technologies often struggle to gain customer approval in their early stages and do not perform better than conventional technologies. As a result, mainstream customers are generally not interested in trying them out, and they are first tested by early adopters, who are typically new customers (Bower and Christensen, 1995; Christensen, 1997).

"Christensen's theory of disruptive innovation has gripped the business consciousness like few other ideas. In a review of enduring business books, The Economist called the theory "one of the most influential modern business ideas". Other commentators have noted that the theory is so widely accepted that its predictive power is rarely questioned. The theory's influence has spread far beyond the business world. Christensen and his associates have proposed disruption as a framework for considering vexing social problems such as poverty, lack of access to health care, illiteracy, and unemployment" (King and Baatartogtokh, 2015:78).

Since introducing disruptive innovation, the theory has piqued the interest of many researchers (Guo et al., 2019) and is considered a critical framework in strategic management (Enders et al., 2006). The original focus of this theory was technological innovations in products and services, but it has recently been expanded to include other innovations, such as social innovation, where the focus is on solving social problems (van der Have and Rubalcaba, 2016).

The theory of disruptive innovation states that revolutionary technological advancements can cause significant changes within industries, resulting in improvements to business models, products, and services. Christensen (1997) identified two methods disruptive innovators use to introduce their offerings and gain market share. The first involves creating a product that may be of lower quality but appeals to customers who find traditional products too complex, expensive, or complicated. The second method targets a group of customers who have yet to be noticed or ignored by established companies. Disruptive innovations also have the power to simplify complicated products and services while reducing their prices, leading to disruption in the existing market and value networks. In some cases, established incumbents may be displaced as a result (Christensen et al., 2019).

Christensen (1997) classified innovations as either disruptive or sustaining. However, according to Denning (2016), there are three types of innovations that fulfil distinct roles in business: disruptive (also known as market-creating innovations), sustaining, and efficiency innovations. Market-creating innovations are critical for growth and are disruptive because they transform complicated and expensive products or services into more affordable and accessible ones that many people can buy. Innovation plays a crucial role in growth, particularly market-creating innovations that make complex and costly products or services more affordable and accessible to a broader consumer base. As stated in Christensen (1997), sustaining innovation involves improving a product or service in line with conventional expectations, while disruptive innovation transforms the performance characteristics of a product or service, creating a new market and value network. Disruptive innovation upsets the existing market and value network, displacing established market leaders, products, and partnerships.

Improving efficiency through innovation helps businesses accomplish more with less. Efficiency innovations focus on enhancing existing products or services, allowing companies to offer them at lower prices to the same customers (Christensen and van Bever Derek, 2014). This type of innovation does not involve creating new products or services but instead concentrates on refining the company's workflow, production, or sales process, resulting in improved business performance and efficiency (Christensen et al., 2019). Efficiency innovations can be as powerful as disruptive innovations and may even displace incumbents. Walmart's innovative business model is an example of an efficiency innovation that disrupted traditional retail stores and enabled Walmart to gain a significant market share. While sustaining innovations are crucial for improving products and increasing sales, they typically do not generate new job opportunities or growth (Christensen, 1997). However, this argument is not always true since Uber, an example of a sustaining innovation has created numerous job opportunities and promoted economic inclusion for new entrants in the metered taxi industry.

Different types of innovations - disruptive, sustaining, and efficiency - serve unique purposes, offer varying advantages, follow distinct paths, and impact the future differently in any industry. Innovators are often small startups operating on limited budgets with fewer resources, working hard to climb the ladder (Christensen et al., 2015). They take advantage of

incumbents' weaknesses, who tend to focus on improving products and services for their most demanding and profitable customers, neglecting others' needs. Disruptive entrants target these neglected customers with innovative solutions that cater to their specific requirements and provide low-priced services and products. As their performance starts matching mainstream customers' standards, they successfully move up the market while keeping their early advantages. The market continues to evolve, and disruption begins when mainstream customers start adopting new offerings in large numbers (Christensen et al., 2017) (Figure 2-5).

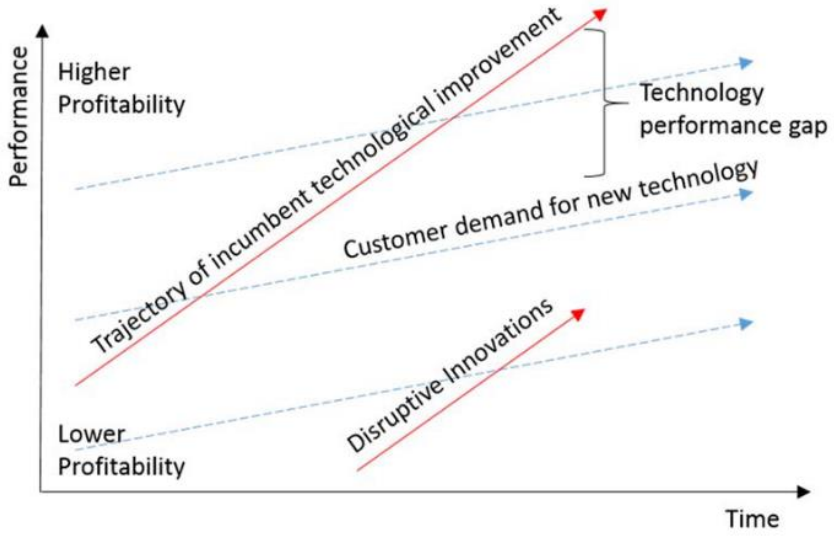


Figure 2-5 Disruptive innovation model (adapted from Christensen et al., 2017)

Innovations of all kinds can positively and negatively affect the economy. Unfortunately, some negative impacts can include the displacement of established businesses. A prime example of this is Kodak, which used to employ many people but lost its market share due to disruptive innovation. As a result, many employees lost their jobs (Assink, 2006). Another example is Uber, which brought a new level of disruption to the metered taxi industry as a sustaining innovation. Uber took a sizable portion of the market share from traditional metered taxis. Additionally, efficiency innovations such as outsourcing can negatively impact the economy. Organisations seeking partners elsewhere to reduce costs and conduct business activities can negatively affect employees' livelihoods, as several employees may lose their jobs during the outsourcing process.

The following section will explore the unique characteristics of various types of innovations. Understanding these distinctions is crucial as it can offer business leaders valuable insights for making informed business decisions. Firstly, it provides business leaders a framework for anticipating the industry's future direction. This is because business models that follow a disruptive or efficiency pathway have different impacts on incumbents and industries than those that follow a sustaining path. Disruptive models often displace incumbents over time, whereas efficiency models do not always unseat incumbents, and sustaining models rarely do. Secondly, this knowledge provides valuable guidance for the leaders of the new entrants seeking to introduce new products, services, or models. Leaders of new entrants can make informed decisions about whether to work with incumbents or compete independently based on these insights (Christensen, Horn, and Staker, 2013). If their products or services have a sustaining trajectory, the authors advise selling their technologies to the incumbents or forming partnerships, as incumbents typically win sustaining battles. On the other hand, if the new entrants enter the market via a disruptive trajectory, they have a chance to compete.

Disruptive (market-creating) innovation

Regarding technology, "disruptive innovation" is a better choice than "disruptive technology". This is because only some technologies are inherently disruptive. Instead, it is the business model that is enabled by the technology that can have a disruptive impact. Pursuant to Christensen, Horn, and Staker (2013), disruptive innovation is when a product or service starts at the bottom of the market or in a new market as an inferior product or service that performs poorly. Initially, mainstream customers do not show interest due to its poor performance. However, customers that incumbent companies have overlooked try it out. As the product or service improves, it gains more traction and moves up the market, eventually disrupting incumbent companies.

An excellent example of this in the financial services industry in South Africa is Capitec Bank. Initially, the bank focused on providing products and services to individuals in the lower Socio-Economic Measure (SEMs) group. However, as Capitec's services and products improved, more customers, including mainstream customers, began to adopt the bank. The low costs associated with disruptive technology, as asserted by Berlin (2011), enabled consumers to switch to it, making it easier for Capitec to attract scores of lower SEM consumers. However, it is worth noting that in the context of fintechs, some disruptive innovations have started at the

top end of the market and targeted elite individuals, e.g., Discovery Bank, the world's first behavioural bank in South Africa, which began by targeting individuals who belong to the higher SEMs.

In accord with Charitou and Markides (2003), disruptive innovation involves introducing a new product or service that improves upon or invents something in a way that the market and established companies do not anticipate. This innovation then creates a new market and value network before disrupting an existing one by outpacing the established leaders in terms of organisation, products, and services (as described by Bower and Christensen, 1995; Christensen, 1997; and Adner, 2002) (as shown in Figure 2-6). Meanwhile, Lettice and Thomond (2002) argue that disruptive innovation involves an improved product, service, or business model that fundamentally alters the performance attributes valued by the mainstream market, thereby changing their demands and needs and ultimately disrupting the incumbents.

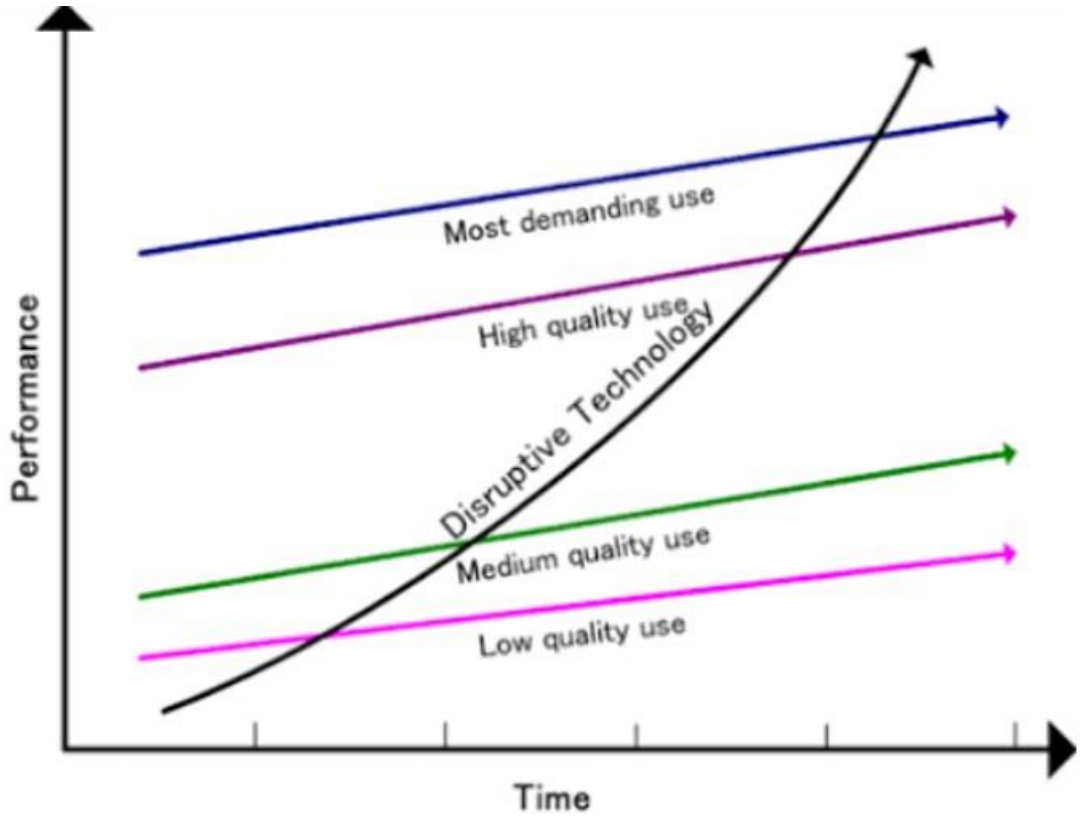


Figure 2-6 Disruptive innovation phenomenon (adapted from Christensen, 1997)

In accordance with Christensen (1997), Lettice and Thomond (2002), King and Baatartogtokh (2015), and Nagy, Schuessler, and Dubinsky (2016), the following main features characterise disruptive innovation:

- During the early stages, the primary customers who generate the most profit hesitate to adopt disruptive technology. Additionally, established companies do not see the value in implementing it due to the lower profit margins. Thus, only smaller and overlooked markets, whose needs are disregarded by established companies, are willing to experiment with innovative technology.
- A specific group of customers highly values the performance features of this product, but they may not be as appealing to the general market. Mainstream customers may perceive the innovation as inadequate, underperforming, and not meeting their desired performance standards.
- Investing in a niche market can improve the performance of a product, service, or business model. This improvement can lead to expansion into new niche markets, attracting more customers.
- When the product gains more attention, it can influence mainstream markets and change their perception of its value.
- This shift in perception can then cause the innovation to disrupt and replace existing mainstream products, services, or business models.

Christensen (1997) illustrated disruptive innovation using the hard disk drive. International Business Machines (IBM) initially created the first disk drive between 1952 and 1956. This disk was as large as a refrigerator and could hold five (5) megabytes (MB) of data. By 1976, disk drives worth around $1 billion had been produced, and this value increased to about $18 billion by 1995. With time, disk storage and performance continued to improve according to the market's demands. The number of megabytes per square inch increased significantly over the years, rising from 50 Kilobytes (KB) in 1967 to 1.7 MB in 1973, 12 MB in 1981, and 1100 MB in 1995. The physical size of the disk was also reduced at a similar pace. The smallest available 20 MB disk shrank from 800 cubic inches in 1978 to 1.4 cubic inches by 1993. Most of these technological advancements resulted from sustaining innovations. However, the most significant changes, which involved architectural innovations that reduced the disk's size from a 14-inch diameter hard disk drive to an 8-inch floppy disk drive, to a 3.5-inch floppy disk drive, and then from 2.5 inches to 1.8 inches, were disruptive innovations. The evolution

continued to compact discs (CDs) and the latest generation universal serial bus (USB) flash drives, which can be as tiny as 0.4 cubic inches and have a storage capacity of 128 gigabytes (GB).

The introduction of disruptive innovations has positively impacted various industries, resulting in the creation of new products, services, business models, and markets. However, it has also led to the downfall of many organisations that once held a dominant position in their respective markets. This is primarily due to their failure to adapt to significant changes brought about by disruptive technologies. Examples of such changes include replacing camera film with digital cameras, the emergence of Netflix and other streaming services that disrupted the movies and cable TV industry, and the advent of Air B ‘n B, which has disrupted the hotel industry. The financial services industry is also experiencing disruptive changes due to the rise of financial technologies.

Sustaining innovations

Christensen et al. (2015) describe sustaining innovations as those that enhance the performance of existing products, services, or business models, thereby fuelling growth in the market. These innovations make already good products even better, appealing to mainstream customers. Examples include improved TV clarity, fifth-generation mobile networks (5G), new mobile phone models, better dishwashing detergents, and Uber, which offers a more affordable and efficient solution for existing taxi customers (Christensen et al., 2019). Incumbents with ample resources tend to capitalise on these innovations and achieve success.

A commonly observed form of this type of innovation is the hybrid, where a new disruptive technology merges with old technology to create a sustaining innovation. This has been observed during disruptive transformations in various industries, including the automobile industry, as it shifts from fuel-based vehicles to engines with alternative power sources. One solution to the challenge of introducing pure disruptive technologies that incumbents may not find compelling is the creation of hybrids. As stated in Christensen, Horn, and Staker (2013), hybrids possess three key characteristics: they incorporate old and new technologies, target existing customers, and aim to perform the same functions as pre-existing technology.

Many individuals do not discern between disruptive and sustaining innovation. To clarify sustaining innovation, it is best to compare it with disruptive innovation in context. For instance, disruptive innovation is often used when a new technology or competitor enters the market with novel methods, services, or products, such as Uber and Airbnb, which some consider disruptive innovations (Paap and Katz, 2004; Christensen et al., 2015). The basic principles of the disruptive innovation theory suggest that Uber is not a disruptive innovation when compared to traditional metered taxis but rather a prime example of sustaining innovation. When Uber first entered the US market, it aimed to attract existing taxi customers, not non-customers, enhancing the taxi industry by providing a more convenient and superior service (Christensen et al., 2015). In contrast, Airbnb represents a standard case of disruptive innovation since it followed the typical path of disruptive innovations. It began by targeting lower-end hotel markets, which catered to people who could not afford hotels (non-customers), and gradually worked its way up to compete with established players (Christensen et al., 2015).

The term ‘disruption’ is ambiguous as it is relative to each industry, as explained by Christensen and Raynor (2003). An innovation may be sustaining for one industry but disruptive for another. For instance, Uber is not a disruptive innovation compared to metered taxis, but Uber SELECT is disruptive to the limousine industry. This is because Uber SELECT introduced luxurious cars (compared to standard Uber) that were more expensive than standard Uber service but more affordable than hiring a traditional limousine. Compared to its market leaders (traditional limousines), Uber SELECT’s service was of inferior quality as it lacked the defining features of a traditional limousine. As a result, it only appealed to a niche market on the lower end of the spectrum. Therefore, these characteristics classify Uber SELECT as a disruptive innovation, as stated by Christensen et al. (2015). It is essential to distinguish between disruptive and sustaining innovation as it offers valuable insights to leaders of startups and incumbent organisations as discussed by Bower and Christensen (1995), Nagy, Schuessler, and Dubinsky (2016), and Guo et al. (2019).

In essence, it can be challenging to distinguish between these different types of innovation. For instance, there is debate over whether online banking is a disruptive or sustaining innovation. While some experts view it as disruptive, others see it as sustaining innovation. In the manner of Christensen (2003), online banking is a sustaining innovation compared to traditional retail

banking. This viewpoint is also shared by Enders et al. (2006), who conducted a study on Nordea Bank. Their research found that online banking is a sustaining innovation because it integrated new technologies with its existing business model.

Contrary, pursuant to Hitt and Frei (2002), online banking can be considered a disruptive innovation in the market. They argue that it competes with traditional banking for high-value customers. A study by Campbell and Frei (2004) on customer profitability supports this idea and categorises online banking as a disruptive innovation. Their research shows that the disruption originated from the low end of the market, a fundamental characteristic of disruptive innovation. These differing viewpoints align with the belief of Christensen and Raynor (2003) that the term "disruptive" is relative.

Efficiency innovations

As businesses strive to keep up with competition and limited resources, they often need new business models to satisfy customers and remain viable (Christensen, 1997). This leads to a focus on efficiency innovations, which aim to improve the production process rather than the target market. By increasing productivity, efficiency improvements can boost profitability and reduce operating costs (Denning, 2016), making them essential for remaining competitive (Christensen and van Bever Derek, 2014). One famous example of an efficiency innovation is outsourcing, where companies partner with external parties to conduct business activities for which they lack the resources. In South Africa, a good example is the collaboration between Tymebank and Pick 'n Pay group. When Tymebank first entered the financial services industry, it partnered with Pick 'n Pay so its customers could deposit and withdraw money at the Pick 'n Pay and Boxer stores. This collaboration enabled Tymebank to carry out a business activity for which it lacked the necessary resources. Some common examples of efficiency innovations in business include relocating operations to regions with lower costs and implementing technology to reduce overhead expenses, resulting in increased profits (Denning, 2016). The primary advantage of such innovations is that they enable companies to achieve more with fewer resources (Christensen et al., 2019).

2.6. EVOLUTION IN FINANCIAL SERVICES

Over the past few decades, the financial services industry has experienced significant changes in its business models, financial instruments, and regulatory and technological barriers (Carter, 1989). These changes began in the 1970s with the introduction of mainframe computers in commercial banking to reduce operational costs and continued throughout the 1980s (Bower and Christensen). The evolution gave rise to fintechs, which are technology-enabled financial solutions that provide highly innovative and revolutionary financial services (Saksonova and Kuzmina-Merlino, 2017).

As the industry moved into the 1990s, it began to use the internet, which led to the launch of the world's first digital-only bank, Security First Network Bank (SFNB), in 1995 (Clark and Lee, 1998). This trend continued to gain momentum, and more money was invested in improving financial services. In 2016, the banking industry's expenditure on information technology increased to around $2.7 trillion globally (Gomber et al., 2018).

These innovations have significantly transformed the financial services industry (CFA Institute Asia-Pacific Research Exchange, 2017), giving birth to new business models that have advanced the delivery of financial products and services to consumers (Yanagawa, 2018), who now demand intelligent and convenient services that can be accessed anytime, anywhere, and at reduced costs (Hwang and Christensen, 2008). Fintechs offer features such as the introduction of new business models, personalisation of customer experience, increased process efficiency, improved accessibility, and high transaction speed, providing a more resilient financial infrastructure, a more effective transaction process, and a more inclusive financial system (Lenz, 2016; Roszkowska, 2021).

On the Contrary, fintech companies negatively impact the incumbents, industry, and its regulations. This is because they usually operate outside the traditional regulatory frameworks (Arner, Barberis and Buckley, 2017; Anagnostopoulos, 2018).

The stylised roadmap in Figure 2-7 details how customers' needs have been provided, the critical gaps issued for financial institutions, and the new financial technology solutions to address these problems.

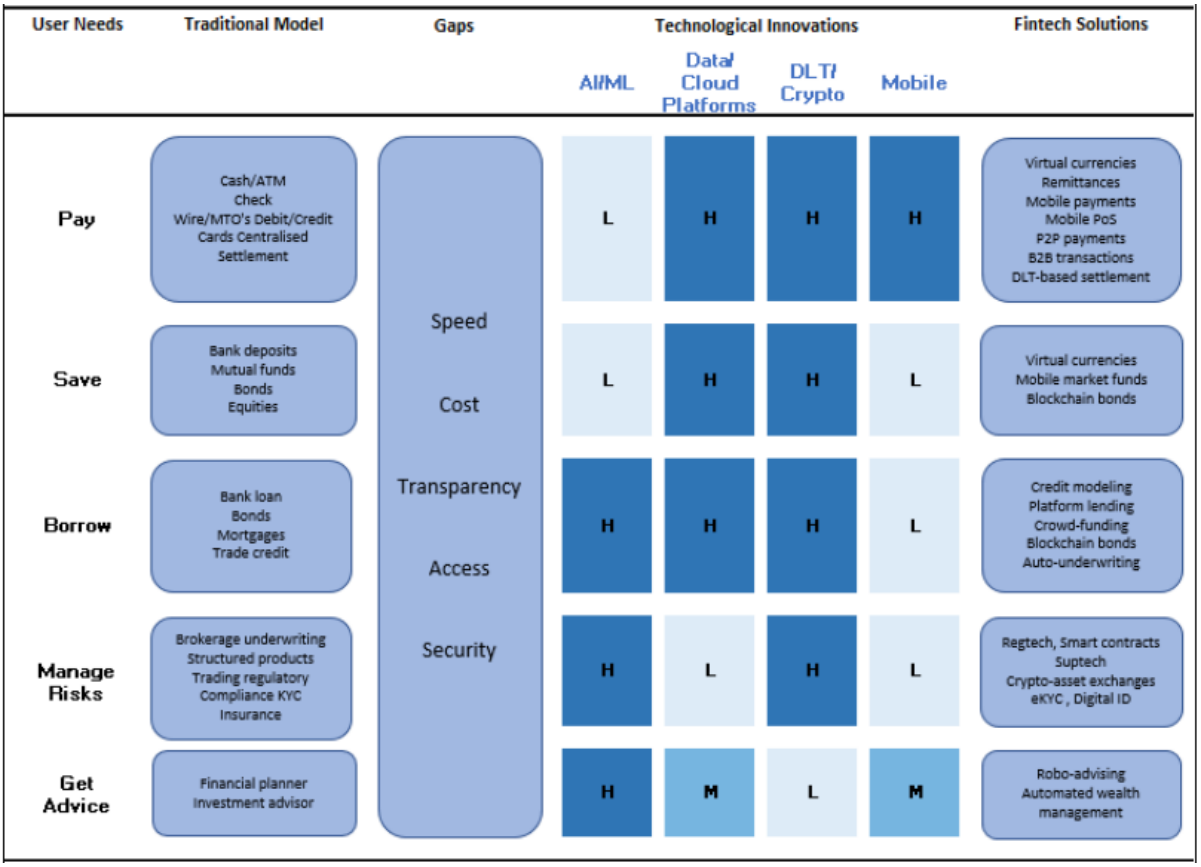


Figure 2-7 Evolution of financial services (adapted from International Monetary Fund, 2019)

*AI/ML= Artificial Intelligence and Machine Learning. Mobile= phones and smartphones are running financial apps. The colour scheme reflects whether the specific technology has a low (L), medium (M), or high (H) level of benefit for the corresponding fintech solutions.

Several factors have contributed to the rise of fintechs. Firstly, customers have become more interested in alternative finance due to their need for more trust in traditional financial institutions after the 2008 global financial crisis. Secondly, financial innovations offer improved products and services at a lower cost. Thirdly, fintech is driven by several technological advancements, such as the accessibility and affordability of infrastructure, advanced technological applications, and business operations. Additionally, Gomber et al.

(2018) have identified three pillars of innovation that are driving the fintech revolution: significant investment in technological innovations in financial services, the creation of new and different technologies and services, and the transformation of business models, financial products, and access by fintech companies.

Tsindeliani et al. (2022) identified several key factors that contributed to the rise and growth of fintech companies, including the low profitability of traditional banking services, a shift in business models by financial market participants towards creating interconnected ecosystems, and the increasing digitisation of financial services, which has expanded their reach. Additionally, banks have lost their monopoly on traditional payment services, while non-financial organisations have become more involved in the financial market. Banks have also faced increasing state control and have sought partnerships with tech startups to remain competitive.

It is worth noting that even though fintechs started gaining traction and more attention recently, the relationship between finance and technology has existed for decades, spanning three distinct eras (as outlined in Table 2-3).

These eras are explained below:

Table 2-3 Evolution of financial technology (adapted from Arner, 2017)

Date	**1866 - 1967**	**1967 - 2008**	**2008 - Current**	
Era	FinTech **1.0**	FinTech **2.0**	FinTech **3.0**	FinTech **3.5**
Geography	Global / Developed	Global / Developed	Developed	Emerging / Developing
Key elements	Infrastructure / computerisation	Traditional / internet	Mobile / Start-ups / New entrants	
Shift Origin	Linkages	Digitalization	2008 financial crisis / smartphone	Last mover advantage

In accordance with Buckley, Arner and Barberis (2016), the evolution of fintech has been categorised into different eras. Fintech 1.0 was characterised by using analogue technologies such as telegraphs, railroads, and steamships to facilitate cross-border financial transactions. In Fintech 2.0, traditional financial services were digitised, and electronic payment systems became more prevalent. The advent of the internet in the 1990s laid the foundation for Fintech 3.0. This era started in 2008 and saw the emergence of new entrants in the form of startups and tech firms using digital platforms to offer financial services, thus competing with banks.

In emerging markets, such as Asia and Africa, Fintech 3.5 is being used to address the issue of financial exclusion, as only 54 percent of people in developing countries have bank accounts compared to 94 percent in developed countries (Gupta, Manrai and Goel, 2019). With more than 1.2 billion people in these regions lacking access to banking services, fintech in the form of digital finance is being leveraged to bridge this gap (Gomber, Koch and Siering, 2017). Governments in these areas are partnering with fintech companies to encourage economic development by allowing non-banking institutions to provide financial services (Buckley, Arner and Barberis, 2016).

KPMG (2022) predicts the following global trends will occur as part of the evolution of fintechs:

- Growing number of banks will offer embedded solutions: Banks want to become service providers to non-bank and non-financial institutions that wish to provide financial services as part of a more extensive offering.
- There will be increased regulatory scrutiny of embedded finance offerings: The increased presence of financial products or services embedded within and delivered by non-regulated entities is expected to raise regulatory awareness and intervention as regulators seek to protect customers by clarifying issues such as accountability and available recourse.
- Fintechs will focus on branding themselves as data organisations: Many fintechs will rebrand as data organisations and data providers that also offer payments and other financial services.
- Environmental, Social and Governance (ESG)-focused fintechs will have a significant growth trajectory: Fintechs with ESG capabilities, such as those focused on climate change, decarbonisation, and the circular economy, will see increased interest.

- There will be a stronger focus on dealmaking in under-developed regions: Investors will place a greater emphasis on developing countries such as Africa, Southeast Asia, Latin America, and the Middle East.
- While unicorn status has been a coveted achievement for companies, particularly in the US, its value may diminish in developed markets. However, it will still hold significant importance for startups in emerging markets and less established fintech hubs as they continue to grow and build their businesses.

2.7. THE RISE OF FINTECHS

The fast-paced development of fintech has opened various business prospects that have proved beneficial for both consumers and innovators. However, these advancements have also led to apprehensions among financial service industry leaders, as noted by several studies (Daniel, 1999; Brown et al., 2004; Gomber, Koch and Siering, 2017; World Economic Forum and Accenture, 2017). The incumbents are concerned that the industry will soon face disruption challenges like those seen in retail, travel, and publishing. At the same time, the regulators are concerned about the lack of regulatory oversight for fintechs compared to the incumbents. These concerns are exacerbated by the rapid growth of fintech compared to traditional financial (Chen and Robinson, 2019). This growth is illustrated in Figure 2-8 below. The figure shows that the Indxx Global Fintech Thematic Index outperforms the financial industry index by 48.59 percent (Palandrani, 2019).

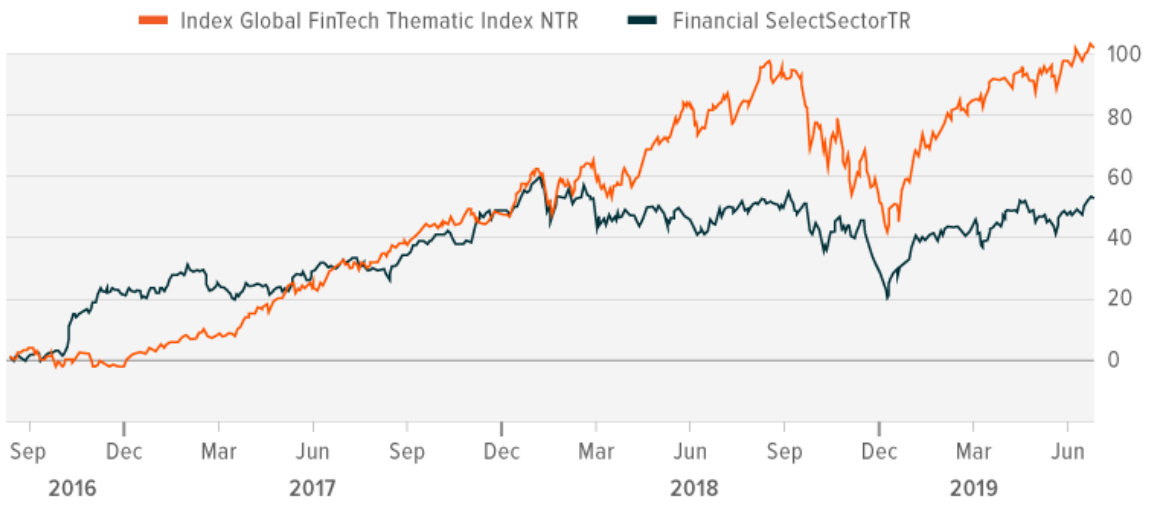


Figure 2-8 Performance of fintech companies tracked by Indxx Global Fintech Thematic Index (adapted from Bloomberg, 2019)

Other studies by Cai (2018), International Monetary Fund (2018), Chen and Robinson (2019) and KPMG (2022) show a significant growth of fintechs. As reported by US Today, in 2015, the fintech market share aimed at Wall Street companies alone was approximately $4.7 trillion in revenue and $470 billion in profits. This number has been climbing annually due to the exponential increase in investment in this industry. For instance, global investment in fintech has risen by over 2,200 percent from $930 million in 2008 to over $22 billion in 2015, then to more than $40 billion in 2017 (Cai, 2018), and further to $57 billion in the first half of 2018 (Chen and Robinson, 2019). Fintech amounted to 6 percent, or roughly $675 billion of the worldwide financial services industry revenue in 2019 (International Monetary Fund, 2019). During 2021, global interest and investment in fintechs grew significantly, and its scope expanded beyond its early definition, with global investment reaching $210 billion. This has been attributed to the maturity of several fintech subsectors, increased investment in emerging markets, and increased corporate interest (KPMG, 2022). Consequently, Goyal et al. (2023), argue that the financial services industry revenue pools are expected to reach $21,9 trillion by 2013, accounting for a 6 percent compound annual growth rate. A significant element of this will come from fintechs, projected to grow more than sixfold from 2021 to 2030 to reach $1,5 trillion (Figure 2-9).

Currently, there are over 32,000 fintech companies operating globally and they have raised more than $500 billion in funding over the last ten years. However, since April 2022, fintech valuations have declined by over 60 percent globally and new funding has also decreased by 43 percent. This is primarily due to rising interest rates caused by persistent inflation, which has been fuelled by various factors such as geopolitical tensions, supply chain issues, and recovery from the COVID-19 pandemic. Despite these obstacles, there is optimism that the fintech industry will continue to grow from its two percent share of global financial services revenue in the long run. As mentioned above, projections show that it will generate $1.5 trillion in annual revenue by 2030. The Asia-Pacific region, especially emerging Asia, is expected to be the largest market with 42 percent of all incremental revenues, followed by North America and Europe/Latin America. Africa also has the potential to create a new financial ecosystem unencumbered by legacy infrastructure (Goyal et al., 2023).

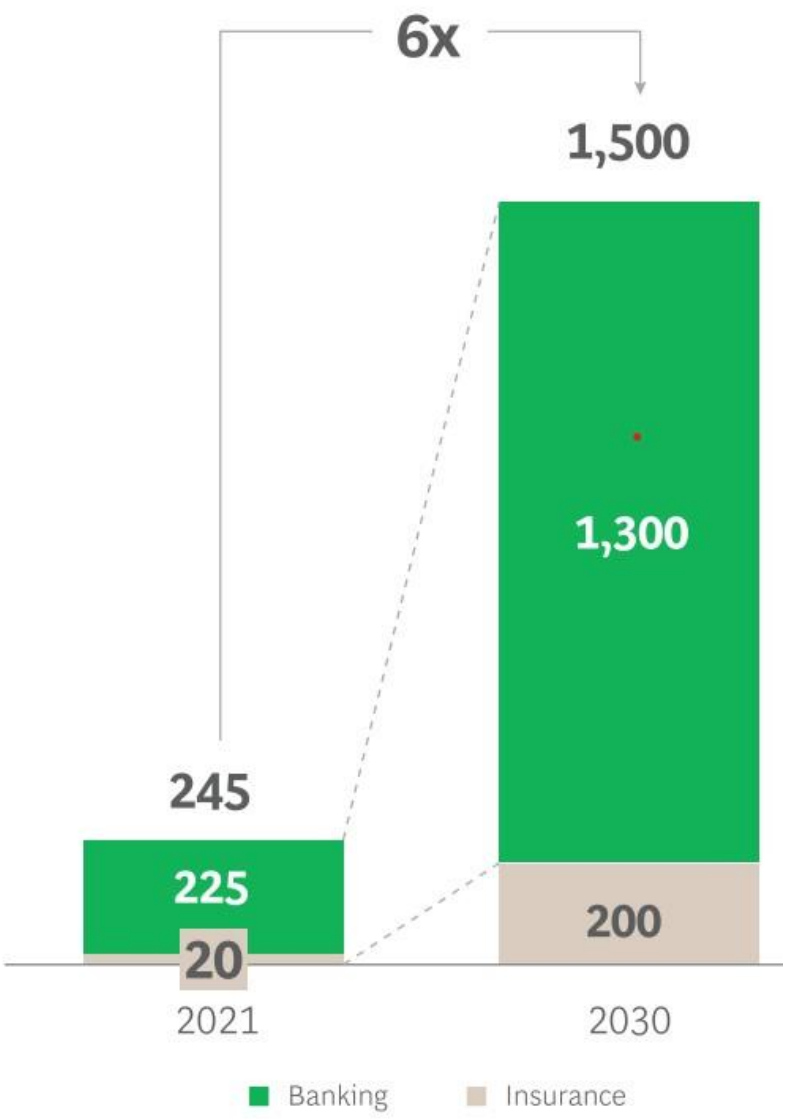


Figure 2-9 Annual fintech revenues will grow sixfold to reach $1,5 trillion by 2030 (adapted from Goyal et al., 2023),

As reported by various sources such as the World Economic Forum (2016), Zetzsche, Buckley and Arner (2017), and Jagtiani and Lemieux (2018), fintechs are rapidly transforming the financial services industry. These companies are key in driving innovation and setting new standards for customer experience and convenience (CFA Institute Asia-Pacific Research Exchange, 2017). Using big data analytics, machine learning, artificial intelligence, and robotics, fintechs have revolutionised the financial industry and reshaped customer expectations (Buckley, Arner and Barberis, 2016; Zetzsche, Buckley and Arner, 2017). The

advancements of these technologies have played a vital role in the emergence of fintechs and the transformation of the financial services industry. This is discussed in detail in section 2.9.

One of the biggest challenges that the financial services industry faced was the omnipresence of financial services. People needed help accessing financial services at their convenience. In the past, one had to wait for the banks to open in the morning before they could carry out financial transactions. However, things have changed now. Thanks to fintech, financial services are no longer limited to bank branches or traditional banking hours. These services have become more personalised using artificial intelligence, machine learning, and big data analytics. Artificial intelligence improves the industry's performance, while analytics and machine learning generate valuable insights. Fintech platforms bring together consumers and other stakeholders, as Vasiljeva and Lukanova (2016) and the World Economic Forum and Accenture (2017) noted. Fintech companies have also created new alternatives to traditional banks and services, transforming business processes. For instance, lending has become a crowdfunded, platform-based business, and other services are now available through non-banking channels that are more attractive and convenient (Gomber et al., 2018; Kapron, 2018).

Gomber, Koch and Siering (2017) provide three features of innovation that financial technologies are using to change the financial services industry:

- Fintech companies provide innovative products, services, and solutions that cater to customers' needs that traditional financial institutions may have missed. One such example is developing a card-reader unit for smartphones and tablets, which allows small-scale merchants and travelling salespeople to accept credit card payments on the move. This technology has made it possible for merchants who cannot afford traditional payment solutions to easily accept card payments.
- Fintechs are utilising innovative technologies and business models to create new avenues for selling products and services.
- Fintech companies prioritise affordable and technology-based business models to rival established players. Their agility gives them an edge over incumbents, as they do not face the same internal bureaucracy.

2.8. DIFFERENT TYPES OF FINTECHS

Fintechs are distinct, primarily led by non-traditional financial organisations such as startups and technology companies (Saksonova and Kuzmina-Merlino, 2017; Goldstein, Jiang and Karolyi, 2019; Nejad, 2022). These entities compete with conventional financial institutions by disrupting all aspects of the industry and can potentially revolutionise how millions of individuals manage their finances (Gomber et al., 2018; Kapron, 2018).

Didenko (2018) enlist distinguishing features of fintechs:

- They are technology-based.
- Fintechs disrupt traditional methods of delivery of financial services.
- They merge various industries (e.g., financial and telecommunications).
- Financial technologies have low costs and barriers to entry.
- Their operations are borderless, and they can easily cross-national boundaries.

There are various types of fintechs, such as digital (-only) banks, online lending, peer-to-peer lending, cryptocurrency or virtual currency, mobile payment, and computer-generated investment advice (Cai, 2018; Najaf et al., 2022). The next section compares the most popular fintechs, i.e., digital banks, crowdfunding/crowdlending, cryptocurrencies or virtual currencies, blockchain technology, and mobile payments. These fintech types serve distinct purposes and offer different advantages and challenges to the industry.

2.8.1. Digital (-only) banks

Studies have revealed the significant impact of digitalisation and the internet on business models worldwide, leading to continuous evolution in financial services delivery. Pursuant to Singh (2004), Gomber, Koch and Siering (2017) and World Economic Forum and Accenture (2017), this evolution is characterised by increased connectivity and faster information processing for both front-end customer interface and back-end processes. Additionally, digitalisation improves consumers' lives and creates new business opportunities, resulting in a leaner and more competitive market. Singh (2004) highlights the emergence of virtual companies without brick-and-mortar infrastructure, enabling businesses to transition to online platforms.

The banking industry has experienced a shift from traditional brick-and-mortar establishments to digital banking systems, as evidenced by the evolution of payment methods such as cheques, electronic cards, and electronic fund transfers leading up to the emergence of digital-only banks (Turcan and Deák, 2021). Digital-only banking offers an alternative to branch-based banking, allowing customers to carry out all or some banking activities, such as bill payments, account opening, and inter-account transfers via digital platforms from the comfort of their homes (Mukherjee and Nath, 2003; Sathye, 2008; Amin, 2009). The advent of digital banking, also known as online or internet banking, has been a significant transformation in the banking industry. The use of the internet to communicate with customers started in the 1990s, and banks provided information on their web pages, including branch maps, ATM locations, phone numbers, and simple product listings. Wells Fargo was the first bank to offer more that this when they launched internet banking services for its customers through its web-based interactive banking in 1995. However, Security First Network Bank (SFNB) made history by launching in October 1995 as the world's first digital-only bank, offering all its services online without any physical branches (Lin et al., 2018). Clark and Lee (1998) report that SFNB achieved over a thousand online cheque accounts within their first eight weeks of operation, with over 10 million visitors to their website in the first few months. This demonstrated the potential for digital banking to revolutionise the industry by offering convenience, security, and efficiency for customers and banks alike (Lin et al., 2018; Dirican, 2015). Despite its growth in popularity, digital banking has yet to replace traditional branch banking fully. It remains to be seen if digital banks will eventually displace traditional branch banking.

2.8.2. Sharing Economy- Peer-to-peer funding and online lending

Pursuant to Yu and Shen (2019), the sharing economy in financial services pertains to digital platform-based activities, including online lending and peer-to-peer (P2P) funding (crowdfunding or crowdlending). These innovative models and platforms, introduced by fintech are powered by the internet and have lured non-bank organisations to venture into the financial services industry (Deloitte, 2022).

Crowdfunding can be either commercial or donation based. In the commercial type, funders expect a return on their investment, while in the donation-based class, funders do not expect any returns (Lenz, 2016). A commercial type of crowdfunding where an online platform

collects funds from a group to finance loans for individuals or businesses is called crowdlending or peer-to-peer lending. Crowdlending is essential in promoting economic democracy and inclusion for lenders and borrowers, playing a significant role in the economy (Yu and Shen, 2019). For instance, crowdfunding has become an innovative way for entrepreneurs to secure funds without relying on venture capital or traditional financial institutions (Mollick, 2014).

Although numerous organisations are in the crowdfunding and lending industry, Lending Club and Prosper are the most prominent players in the personal lending sector worldwide. These institutions were established in 2006 and have grown their annual revenues to hundreds of millions of US dollars, as Jagtiani and Lemieux (2018) reported. This industry (crowdfunding) is experiencing rapid year-on-year growth resulting in an exponential increase in funds raised annually. Cai (2018) supports this by stating that in 2016, the amount raised reached $300 billion, compared to $100 billion in 2015 and $1.5 billion in 2011. As stated in Lenz (2016) and Cai (2018) lending-based crowdfunding is the dominant crowdfunding method based on the amount of capital raised.

In accord with Cai (2018), besides crowdlending, crowdfunding is further divided into two types- crowd investing and reward-based crowdfunding:

- Crowd investing involves investing funds in a startup company, and the return on investment is connected to its profits. This type of investment has attributes of both equity and debt capital.
- Reward-based crowdfunding involves using funds to support specific projects, with returns on investment being non-monetary and directly related to the project being funded.

As reported by Transunion (2017), fintech lenders had gained a 30 percent market share in the $112 billion personal unsecured loan market by the third quarter of that year. This was a substantial rise from their three percent market share in 2010, given that the first fintech lending platform only surfaced in 2005, as noted by Jagtiani and Lemieux (2018).

Fintech platforms approach lending decisions differently from traditional financial institutions. They use alternative methods to gather soft information about a consumer's creditworthiness, such as artificial intelligence and big data analytics that analyse personal information like social media activity, age, education, and place of residence based on the customer's behaviour (Lenz, 2016). In contrast, traditional institutions rely on analysing a customer's credit score, derived from codified, explicit information such as income statements and implicit information from the bank's relationship with the customer. Fintech lending processes benefit customers with little or no credit history and may not be eligible for bank loans (Jagtiani and Lemieux, 2018; Nguyen, Tran and Ho, 2021).

Dhar and Stein (2017) identify three fundamental characteristics of platforms:

- Platforms are open and facilitate easy participation.
- They utilise networks to implement crucial business and operational processes, which enhances their value with increased participation.
- Automation is incorporated into platform business processes.

It is predicted that young consumers, especially millennials, who form a significant portion of the consumer population, will be the biggest users of online lending platforms in the future because of their comfort with technology (Price Waterhouse Coopers, 2016). This trend is supported by experts such as Palandrani (2019) and Nejad (2022), who argue that millennials and Gen Zs prefer financial services that provide convenience through technology-enabled platforms.

The lending volume of nonbank lenders is currently lower than that of traditional banks, and it remains to be seen how their presence will impact conventional banks in the long run. However, the rising number of nonbank lenders indicates potential disruptions that require careful observation and attention (Jagtiani and Lemieux, 2018).

2.8.3. Blockchain technology

As a distributed database, a blockchain contains a list of records linked together through chains of blocks. Each block contains information about a specific transaction (Xia et al., 2017). In the manner of Esmaeilian et al. (2020), blockchain is a distributed ledger sharing data across a

peer-to-peer network. Nodes store information in an ordered list and are connected via chains, as explained by Gorkhali (2020). Unlike centralised systems, blockchain allows network members to communicate and validate data without a central authority. This technology can prevent information leakage by enabling users to verify transaction attributes and enforce contracts without disclosing sensitive information to third parties, as noted by Catalini and Gans (2020). Furthermore, blockchain technology can significantly reduce transaction costs, according to Cennamo, Marchesi, and Meyer (2020). Saberi et al. (2019) identified four key features of blockchain technology: decentralisation, security, auditability, and intelligent execution.

Blockchain technology first gained popularity as the driving force behind Bitcoin (Cong and He, 2019). In recent years, there has been a significant increase in interest in blockchain, and it has expanded beyond virtual currencies. Now, it is being used in numerous areas of financial services, including capital raising, trading, clearing, and settlement, global payments, deposits, and lending, insurtech, digital identity management and authentication, automated compliance, administration and risk management, anti-money laundering, and client suitability checks (Manta and Pop, 2017). The technology's benefits, such as reliability, traceability, information authenticity (Saberi et al., 2019), and transparency (Mas et al., 2020), coupled with its widespread application, have led to extensive research in various scientific and practical fields (Sharma, Jindal, and Borah, 2020).

Blockchain technology has proven to be a versatile tool in various industries, including digital exchange (Manta and Pop, 2017; Zetzsche, Buckley and Arner, 2017; Varma, 2019). It has emerged as a progressive solution to address technology challenges such as data ownership, identity, trust, decentralisation, and information-driven choices (Sharma, Singh and Sharma, 2020). Blockchain systems offer reliable and tamper-proof solutions by providing a secure and automated method for asset ownership accounting (Caton, 2019). One notable example is Bitland, a blockchain used in agriculture in Ghana, which has helped solve the land registration issue, with 90 percent of agricultural land undocumented. Bitland records every piece of land stored on a blockchain, making them less susceptible to forgery or tampering, much like Bitcoin (International Monetary Fund- African Department, 2019).

In accordance with Petrov (2020), the financial services sector, plagued by slow, inefficient, and costly processes, could benefit from blockchain's transformative potential. With its ability to offer sophisticated financial products and automate manual document processing, blockchain technology could revolutionise the financial services industry.

2.8.4. Cryptocurrency or virtual currency

Financial technology is revolutionising the foundation of financial services - the currency structure. For a long time, this aspect remained untouched and exclusive to governments. However, with fintech's innovative alternative currencies in the form of cryptocurrencies or virtual currencies, the status quo has changed. Virtual currencies have decentralised control of the money supply, meaning that it is no longer solely the jurisdiction of the government to create and distribute money. Mazambani and Mutambara (2019) put this into perspective when they succinctly argue that this technology has transformed the global financial market by creating a borderless financial structure.

Before fintechs emerged, banks had a hand in changing how money is created and distributed. For instance, banks allowed individuals to deposit money into their reserves and lend it to borrowers. Credit cards also made it possible for people to exchange money without needing physical cash. Pursuant to Nakamoto (2008), banks used to serve as trusted third parties for processing electronic payments. However, the system had its limitations since it needed more complete trust. As a result, there was a need for innovative solutions that could eliminate these challenges. The response was to introduce a model that eliminated financial institutions and government from the process. This model uses decentralised, peer-to-peer networks enabled through blockchain technology, which is a tamper-resistant, append-only public ledger of transactions (Magnuson, 2018; Varma, 2019).

This technology operates differently from traditional methods because it utilises a publicly accessible ledger called blockchain to record transactions (Magnuson, 2018; Cennamo, Marchesi and Meyer, 2020). With blockchain technology, electronic cash can be transferred from one party to another without the involvement of a financial institution (Nakamoto, 2008; Magnuson, 2018; Chatham and Duncan, 2020). The ledger keeps a record of all prior

transactions and is continuously downloaded by users, verifying, and confirming each transaction. The network acts as a custodian and oversees the creation and transfer of currency. Unlike traditional methods that rely on a trusted institution to maintain the authoritative record, the blockchain allows all interested parties to keep their copy of the ledger, which is decentralised and replicated. Cryptographic integrity checks are utilised to ensure that nobody corrupts or tampers with their copy of the ledger (Esmaeilian et al., 2020). The blockchain maintains integrity by linking blocks of transactions together so that altering one block breaks the link in the next block. This ensures that while new blocks can be added at the end, older blocks remain immutable, meaning no one can alter the system (Varma, 2019; Esmaeilian et al., 2020). In this technology, new currencies are generated through mining (Magnuson, 2018). In contrast, Ethereum uses smart contracts that rely on algorithms instead of traditional legal systems (Magnuson, 2018). These contracts are computer-coded combinations of protocols that formalise and secure relationships over computer networks (Varma, 2019). Cryptocurrency represents the most successful application of blockchain technology according to Hashemi Joo, Nishikawa, and Dandapani (2019).

Several virtual currencies exist, including Bitcoins, Litecoin, Ripple (XRP), Ethereum, Zcash, and Pi. Of these, Bitcoin is the most widely used, with 595145 daily transactions as of July 16, 2023, (Nasdaq, 2023). Virtual currencies have become increasingly important due to their potential to revolutionise the financial services industry. For example, Ripple is expected to grow significantly in the future, mainly due to its application in the global remittances market, where blockchain technology is expected to contribute significantly (Hashemi Joo, Nishikawa and Dandapani, 2019). Ripple enables cross-border transactions at a much lower cost and faster speed than traditional non-distributed ledger platforms. Transactions are settled in three to five seconds, compared to the hours or days it may take for a bank to transfer through traditional means (Ripple, 2020). Unlike Bitcoin, Ripple does not compete with fiat currencies. Instead, it acts as a link between fiat currencies during cross-border transactions (Mason, 2021).

Given the speed with which Ripple enables cross-border payments, this technology or similar technologies can significantly benefit consumers when local banks use them to facilitate and expedite intra-country transfers. Currently, in South Africa, for example, when one transfers money from a bank account held by Bank A to a different bank account held by Bank B, it

usually takes 24 to 48 hours to clear the funds so that they can appear in the receiving account, or one is forced to pay a certain fee if they want the money to appear in the receiving account immediately.

Many global payment service providers have partnered with Ripple, including SBI Remit, Japan's largest money transfer provider. In 2016, SBI Remit joined the Ripple blockchain network to enable their mostly Thai customer base living in Japan to send remittances to Thailand. Other global payment providers, such as IDT (USA), Earthport (U.K.), TransferGo (U.K.), UAE Exchange (UAE), AirWallex (Australia), and LianLian International (China), have also implemented RippleNet. In 2018, Western Union also partnered with Ripple (Hashemi Joo, Nishikawa, and Dandapani, 2019). American Express, PNC, Santander, SCB, NUIM, Banco Rendimento, Bee Tech, Ria, Transfer Go, Viamericas, Pontual, Iremit, and CIMB Bank are among the other institutions that use Ripple (Ripple, 2021).

2.8.5. Mobile payments and mobile money

In the manner of Dahlberg et al. (2008), mobile payments refer to paying for goods, services, and bills using a mobile device. These payments can be divided into two categories: payments for daily purchases and payment for bills. When it comes to purchasing, mobile payments compete with cash, cheques, credit cards, and debit cards. For bill payments, mobile payments provide access to account-based payment instruments such as money transfers, internet banking payments, direct debits, or electronic invoice acceptance (International Monetary Fund, 2019). Mobile payments use mobile money features, along with API and Quick Response (QR) codes, to bring about changes to payment systems. This unbundling of payment services from primary accounts makes them faster, more cost-effective, and always available, thus making them more user-friendly (International Monetary Fund, 2019).

Mobile payments originated in Finland in 1997 with Coca-Cola's introduction of a vending machine that accepted short message services (SMS) payment (Dahlberg, Guo and Ondrus, 2015). Over time, this mobile payment system has gained popularity worldwide, especially in developing nations, thanks to its minimal infrastructure needs (Jang and Park, 2016), customer-friendly interface, and cost-effective customer acquisition strategies employed by fintech companies (Lee and Shin, 2018).

The growth in digital payments can also be attributed to various factors, including changes in consumer behaviour, such as the increasing preference for non-cash transactions, the widespread use of the internet, and the rise in mobile phone users, which according to Liébana-Cabanillas, Molinillo, and Ruiz-Montañez (2019), has exceeded five billion. As a result, digital payments have become more accessible and convenient, leading to rapid growth (Palandrani, 2019; Alkhowaiter, 2020). In 2012, there were 134 million registered mobile money accounts worldwide. By 2021, this number had increased tenfold to over 1.35 billion (Figure 2-10) (Awanis et al., 2022). These changes have also contributed to China's non-cash payments market becoming one of the largest in the world (Kapron, 2018; Alkhowaiter, 2020). Meanwhile, Africa has become the global leader in mobile money, with close to 40 out of 45 Sub-Saharan African countries actively using this technology. East African countries are leading the way in adoption and usage rates (International Monetary Fund-African Department, 2019).

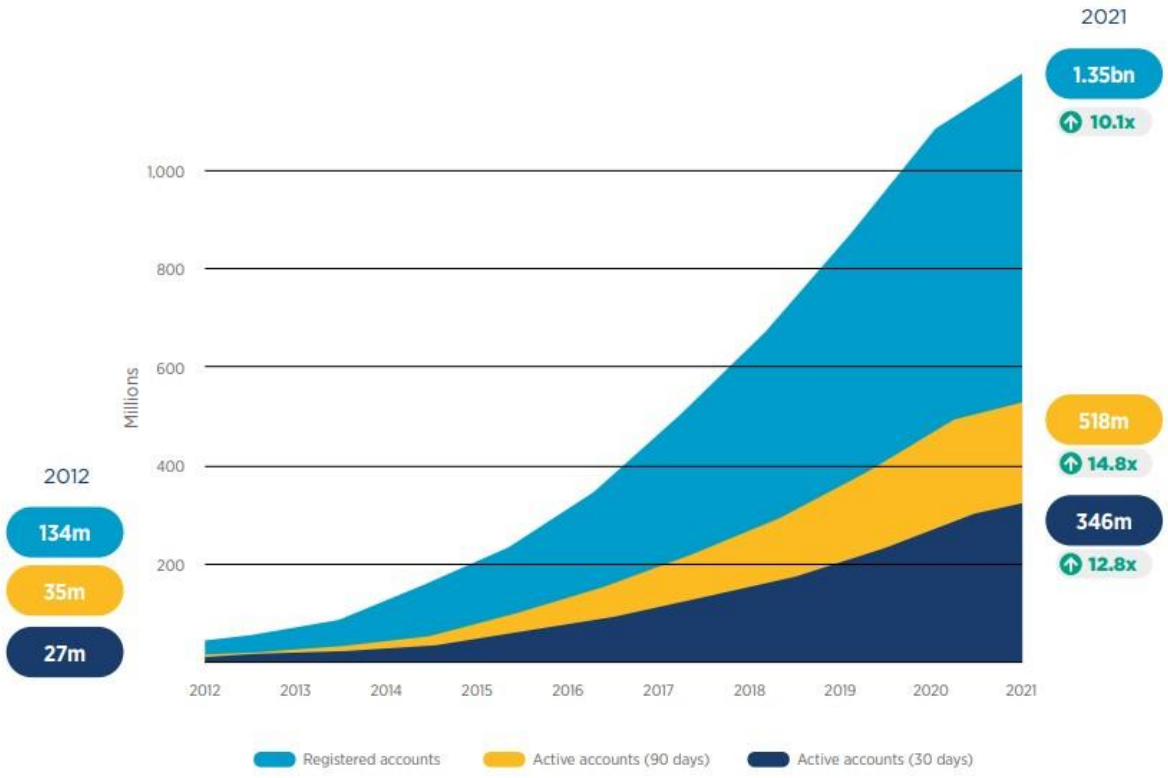


Figure 2-10 Number of registered and active mobile money accounts globally, 2012 to 2021 (adapted from Awanis et al., 2022)

The Sub-Saharan Africa region has a higher adoption rate of mobile money compared to traditional banking services, as reported by the International Monetary Fund- African Department (2019). Consequently, this region has more mobile money agents than ATMs or bank accounts. This has played a critical role in increasing financial inclusion (Arslan et al., 2021).

In the Asia Pacific region China has become a dominant player in the mobile money market. As of 2016, China accounted for 99.2 percent of the total mobile money market globally, with about 85 percent of the total market share (Xu, Tang and Guttman, 2019). China's UnionPay facilitates using UnionPay credit and debit cards at an estimated 26.7 million merchants equipped with electronic point-of-sale devices with near-field communication (NFC) technology, allowing for mobile payments. Additionally, over 1.3 billion consumers in China use Alipay and WeChat Pay, which make up more than 90 percent of the third-party mobile payment market, to process payments using their mobile phones (Han, 2021). In 2017, digital payments worth nearly $5 trillion were processed (Kapron, 2018), and China witnessed significant growth in mobile payments over the past five years. In 2018, mobile transaction volume in China grew more than 28 times, processing $41.51 trillion (Kharas and Dooley, 2020) and $50 trillion in 2019 (Han, 2021). In 2022 China recorded 159 billion mobile payment transactions, up from 151 billion the previous year (Statista, 2023).

Over the past decade, the payment industry has experienced significant growth worldwide. As stated in Alkhowaiter (2020), the mobile payment market was worth $3.9 trillion in 2019 and is expected to reach $86.9 trillion by 2025.

Various mobile payment service models are available globally, and most rely on a trusted service manager (TSM) to facilitate communication between banks, telecommunications operators, and mobile payment service providers. The TSM offers standard features for implementing and verifying services that any network participant can provide, including banks, telecom operators, payment service providers, or independent entities (Reuver et al., 2015). Historically, mobile payments have been dominated by mobile network operators (MNOs).

Still, fintech organisations and traditional banks have recently started exploring the mobile financial services (MFS) landscape (Chironga, de Grandis, and Zouaoui, 2017).

2.9. FINTECHS DRIVERS

The financial services industry and businesses have undergone significant transformations in the digital age, resulting in increased efficiency for organisations and customers (Dirican, 2015; Hornuf and Haddad, 2019). Robotics, artificial intelligence, machine learning, big data, and the internet are now employed to make business decisions more efficiently and quickly. Additionally, mobile devices can now do financial transactions (Liébana-Cabanillas, Molinillo and Ruiz-Montañez, 2019). The following section will explore how these technologies are shaping the financial services industry.

2.9.1. Artificial Intelligence and machine learning

Artificial Intelligence (AI) refers to the programming of machines to carry out tasks that require human-like intelligence (King, Hammond and Harrington, 2019). The term "artificial intelligence" was first coined during the 1969 International Joint Conference on Computer Science in Washington, according to Kornienko et al. (2015). One of the most popular fields within AI is machine learning (ML), which enables computer systems to predict outcomes based on data without being explicitly programmed. Unlike traditional computing, ML leverages historical data to create algorithms that provide solutions (Jordan and Mitchell, 2015). In ML and other AI systems, the machines are exposed to massive amounts of data and learn how to compute their algorithms to explain the data without explicit programming (King, Hammond and Harrington, 2019).

Artificial intelligence and machine learning advancements have revolutionised industries beyond what was thought possible. AI has been integrated into various fields, such as medicine, transportation, retail, and financial services. It has even taken over traditional human tasks, such as predicting diseases, granting loans, and hiring, among others, leading to machines assuming decision-making roles previously held by humans. As a result, people have varying emotions, opinions, and perspectives regarding artificial intelligence (Yanisky-ravid and Hallisey, 2019). In fact, there are two differing views on the impact of AI.

One school of thought believes that AI is a crucial element that enhances the quality of life, while the other perceives it as a threat to human livelihoods, particularly their jobs. Critics argue that AI's introduction to various industries leads to the loss of many roles that were traditionally carried out by humans (Dirican, 2015). Wilson, Daugherty and Morini-Bianzino (2017) support this viewpoint, suggesting that advanced AI systems threaten human jobs as they outperform humans in many positions (Siau and Wang, 2018). Bruun and Duka (2018) also agree, stating that AI is gradually replacing humans in fields that were once highly dependent on human intelligence and skills. Additionally, Wang and Siau (2019) posit that AI is already replacing humans in numerous jobs, including insurance claims and assessments, accounting, and healthcare assistants.

Conversely, Wilson, Daugherty and Morini-Bianzino (2017) argue that AI is expected to create new job opportunities as humans will be needed to train AI systems to perform tasks. Moreover, companies will require employees who can explain the workings of AI to non-technical staff. Similarly, the World Economic Forum and Accenture (2017) also acknowledge the positive impact of AI, stating that it enables organisations to expand people's capabilities and liberates them to concentrate on solving more complex issues.

In accordance with Bughin et al. (2017), organisations that fully utilise AI gain a competitive edge, and many already benefit from this technology. By automating specific tasks, employees are freed up to focus on other strategic areas that can increase revenue and reduce overall employee numbers, thereby lowering operating costs (Levy, 2018). In addition, as stated in Wang and Siau (2019), AI-powered systems in the financial services industry have the potential to identify financial misconduct, thereby assisting in the battle against financial offences like credit card fraud, money laundering, and synthetic identity theft.

Flavián et al. (2021) claim that the use of AI in financial services will grow in the future, and Maskey (2018) predicts that the banking industry will reap the most benefits from AI. It is projected that artificial intelligence could save the banking industry up to $1 trillion by 2030, as estimated by Bain and Company. Accenture also estimates that AI will provide the finance industry with a value of $1.2 trillion by 2035 while reducing expenses by $1.1 trillion. AutonomousNext (2018) predicts that the financial services industry can expect savings across various areas of its value chain, such as the front office, retail branches, middle office, and back

office. Specifically, the front office is projected to save around $490 billion, with almost half of that amount ($199 billion) coming from retail branches, security, tellers, cashiers, and other staff reductions. The middle office is estimated to save $350 billion. In comparison, implementing artificial intelligence in authentication and data processing will save banks and credit bureaus approximately $217 billion. Lastly, the back office will save around $200 billion, with underwriting and collections systems contributing $31 billion to the overall savings.

2.9.2. Robotics

Oxford English Dictionary states that a robot is distinct from a computer because it is a machine that imitates human functions and can automatically repeat specific actions. On the other hand, a computer is an electronic device that stores and processes data in binary form, following instructions in a variable program.

Using robots is categorised as robotic process automation (RPA) in the business world. This involves using software robots or virtual assistants programmed to carry out repetitive and laborious tasks (Maček, Murg and Čič, 2020). Boulton (2018) defines RPA as a technological application that utilises structured inputs and business logic to automate business processes. In accord with Bellan (2018), robot processing automation employs software that imitates human actions to execute specific business processes.

The financial technology industry uses robots to streamline processes, reduce expenses, and promote accessibility. Robo-advisors, for instance, aid consumers save on management fees in wealth management. Traditional financial services providers usually charge clients a cost of one percent or more on managed assets in this industry, while robo-advisors can charge between 0.15 and 0.35 percent. In addition, robots are utilised as chatbots to advise clients, a task typically carried out by brokers and financial advisors in insurance companies (Magnuson, 2018). They also handle activities such as processing sales and financial transactions, managing data, and communicating between systems (Seasongood, 2016). Another instance is the employment of robo-advisors to decrease the taxable income of taxpayers by determining

which investment to sell or keep. They select assets that have incurred losses and sell them while retaining prospering investments (Magnuson, 2018).

The introduction of robots in organisations is expected to significantly impact human resources and can be particularly beneficial for the banking sector, as reported by Dirican (2015). Various departments, such as customer service, can utilise robots and AI technology, suggests Yanisky-ravid and Hallisey (2019). Moreover, robotic automation can offer solutions that enhance organisational efficiency in various work areas by reducing costs, increasing profits, and eliminating time-consuming manual processes (Seasongood, 2016).

By utilising robotics, organisations can significantly decrease the time required to complete tasks that would typically demand thousands of staff hours. This results in more efficient use of resources, enabling personnel to focus on higher-level roles, tasks with high-profit margins, and strategic initiatives (World Economic Forum and Accenture, 2017). Additionally, robotics plays a crucial role in supporting shared service centres, which are often outsourced, reducing the reliance on service centres and, in some instances, eliminating the need for them (Yanisky-ravid and Hallisey, 2019). Robotic automation also overcomes space and time constraints by making services accessible anywhere and at any time (Seasongood, 2016).

2.9.3. Big Data

Organisations use automation regularly to collect a massive volume of structured and unstructured data, known as big data (Fox and Do 2013). These data are analysed to gain valuable insights that can aid in making better decisions and strategic moves. Like artificial intelligence, machine learning, and robotics, big data helps organisations enhance their efficiency (Edu, 2022) and effectiveness, create new products, services, and business models, and gain a competitive advantage while pursuing new growth opportunities (Mungai and Bayat, 2018; van den Broek and van Veenstra, 2018).

Advanced data processing coupled with increased usage of big data and alternative data in combination with the increased use of mobile phones is having a profound impact on the financial services industry (Chen et al., 2017), and in the developing world is building a

financial system that is accessible for all (Jagtiani and Lemieux, 2018). Big data has empowered the financial services industry with the ability to design customer-centric service, operational process improvement, financial management, and the development of new financial products (Edu, 2022). The new business models, like online lending, driven by big data (Jagtiani and Lemieux, 2018), have introduced intelligent, personalised, low-cost financial services that compete with incumbent financial institutions (van den Broek and van Veenstra, 2018).

The financial services industry is experiencing a significant impact from advanced data processing, increased big and alternative data usage, and the widespread use of mobile phones (Chen et al., 2017). This impact has resulted in creating a financial system accessible to all in developing countries (Jagtiani and Lemieux, 2018). The use of big data has enabled the industry to offer customer-centric services, improve operational processes, manage finances, and develop new financial products (Edu, 2022). Online lending, driven by big data, has introduced intelligent, personalised, and low-cost financial services that compete with traditional financial institutions (Jagtiani and Lemieux, 2018), resulting in the emergence of new business models (van den Broek and van Veenstra, 2018).

Incorporating big data analytics is crucial in the back-office operations of financial institutions (Mungai and Bayat, 2018). This technology facilitates the creation of precise financial decisions that rely solely on facts and statistics, eliminating personal biases or intuition (Das, 2019; Miskam, Yaacob, and Rosman, 2019). Furthermore, it allows for quick credit decisions that can be made almost instantaneously (Jagtiani and Lemieux, 2018). Large amounts of data are collected from various platforms, including social media and online searches, to study people's behaviours in making financial services decisions, such as whether a customer qualifies for a loan or credit limit increase. This ensures that personalised financial services are provided.

2.9.4. Coronavirus disease

Coronavirus disease (COVID-19) is a contagious illness caused by the Coronavirus. It was first detected in Wuhan, China's Hubei Province, in December 2019. People can contract the virus

through direct contact with an infected person. Symptoms may include fever, cough, fatigue, and body aches, like the common cold or flu. The virus's incubation period can range from two to fourteen days (Zhai et al., 2020).

In January 2020, the WHO declared COVID-19 a global emergency as the number of cases rapidly increased. By March 2020, the WHO declared the outbreak a global pandemic, with over 140 countries affected and 168,826 cases and 6,503 deaths confirmed (Zhai et al., 2020). As of January 31, 2021, there have been over 101,917,147 confirmed cases and 2,205,515 deaths worldwide (WHO, 2021). As of July 2022, there were 562,672,324 cases confirmed and 6,367,793 deaths, and in mid-September 2022, the confirmed cases had risen to 609,247,113 and fatalities related to this virus had risen to 6,503,894 (WHO, 2022). Globally, as of July 12, 2023, WHO had confirmed 767,972,961 cases of COVID-19 and 6,950,655 related deaths (WHO, 2023). This pandemic negatively impacted the global healthcare systems with a ripple effect on every aspect of human life (Nicola et al., 2020), and its general outlook was a global recession (Babuna et al., 2020). However, as vaccines began to reach more countries in the first half of 2022, the severity of the virus started to decrease, more governments began to relax COVID-19 restrictions, and industries began to return to some degree of normalcy. As of July 9, 2023, 13,474,185,140 vaccine doses had been administered (WHO, 2023).

Throughout history, humanity has encountered various natural disasters, including floods, earthquakes, civil wars, and other large-scale calamities. However, the emergence of the COVID-19 pandemic was a unique challenge (Conti et al., 2018; Kells, 2020). The pandemic disrupted the global economy (Zhai et al., 2020) and prompted governments worldwide to implement social distancing measures (Nicola et al., 2020) and encourage contactless business practices to control the virus's spread (Wójcik and Ioannou, 2020). This pandemic has permanently altered the workplace and how people will work in the future (Dwolatzky and Harris, 2020), with several industries experiencing negative impacts (Sandeep et al., 2020).

The COVID-19 pandemic resulted in stricter responses than previous pandemics, such as the complete lockdown of countries, travel bans, and public gatherings and schools (Babuna et al., 2020). These responses caused a decline in the demand for commodities and manufactured

products, except for healthcare products, where there was a surge in demand for medical supplies (Nicola et al., 2020). Within a few weeks of the outbreak, COVID-19 sent shock waves throughout the global economy, affecting stock markets, consumer confidence, and global supply chains (Kabadayi, O'Connor, and Tuzovic, 2020). The world witnessed the sharpest drop in gross domestic products in living memory (Kells, 2020). The macroeconomic impacts and risks, including the competing dangers of inflation and deflation, seriously threatened economic growth (Kells, 2020).

The impact of this pandemic's catastrophe and its global economic destruction demonstrated that apocalypses have the potential to cause astronomical economic harm (Goodell, 2020). Businesses had to rely heavily on automated and technology-driven business processes to respond to these changes. The use of technology was driven by necessity due to the sudden changes brought about by the pandemic (Dwolatzky and Harris, 2020). With social distancing, remote work, and travel restrictions in place, there was a surge in online shopping, mobile learning, mobile banking, and web-based communication tools like Zoom, WebEx, and Skype meetings (Sandeep et al., 2020). Thanks to these interventions, industries, and institutions, such as banks, could operate even during the peak of the pandemic and beyond (Kells, 2020). Consequently, Baret et al. (2020) referred to the COVID-19 pandemic as a catalyst that hastened the shift towards financial technologies.

Despite the uncertain long-term impact of COVID-19 on numerous companies, including those in the financial services sector, the industry undoubtedly gained valuable insights. These include strategies for maintaining organisational resilience in the face of potential disasters and developing new operating models, such as alternative work arrangements (Dwolatzky and Harris, 2020). A summarised comparison is presented below to provide an overview of the impact of COVID-19 on different aspects of financial services.

Financial Markets: It is common for financial markets to respond to natural disasters such as earthquakes, floods, and volcanoes, as noted by Goodell (2020). Similarly, it is not surprising that the negative economic impacts of COVID-19 resulted in significant market volatility (Kells, 2020). This further added pressure to already struggling international financial markets,

which were already fragile, according to Szalay (2020). The pandemic raised concerns about high default rates on loan repayments and the possibility of connecting risks typically not associated, such as market and settlement risks. This, in turn, increased financial risks, as noted by Kells (2020).

Insurance: In times of crisis or disaster, individuals often rely on the insurance industry for protection against damages. Unfortunately, the COVID-19 pandemic posed significant challenges to this industry, as it overwhelmed many institutions and weakened some insurance companies financially (Babuna et al., 2020). The high number of infection cases and slow recovery rates increased insurance claims (Hay, 2020). Moreover, due to the uncertainty brought about by the pandemic, some companies halted the provision of insurance products, including credit life insurance, during heightened infections and strict lockdowns.

Banking: The banking industry in developing countries is typically significantly impacted by large pandemics. The rise in the number of infected individuals in the population leads to the downfall of the banking industry and puts pressure on banks to use their reserves (Lagoarde-Segot and Leoni, 2013). Economic downturns make banks vulnerable due to the possibility of non-performing loans and, in extreme cases, bank runs (Goodell, 2020). During a pandemic, microfinance institutions and banks' lending to people with low incomes is also affected as the population struggles with the pandemic's effects (Skoufias, 2003). Consequently, it was not a surprise that in response to the COVID-19 pandemic, financial institutions opted for a conservative lending policy (Goodell, 2020).

Online or digital banking: The COVID-19 pandemic significantly impacted people's daily lives worldwide, leading many to reconsider their financial management and transaction methods due to social distancing measures and stay-at-home recommendations (Lake, 2020). As a result, consumers were encouraged to opt for online banking instead of traditional branch banking (Shahabi et al., 2020), leading to increased demand for online banking services and a decrease in traditional banking methods (Ul Haq and Awan, 2020). This resulted in a significant rise in online banking adoption (Yeganeh, 2021). Baldwin and di Mauro (2020) and Wójcik and Ioannou (2020) also agree that COVID-19 social distancing measures caused many

bank customers to switch to online banking. In addition, Shahabi et al. (2020) points out that bank closures due to national shutdowns and employee infections prevented customers from accessing branches, leading to a shift towards online banking.

Handling of cash: As COVID-19 rapidly spread across the globe, various institutions, including central banks, sought ways to slow down the virus and protect their businesses. For instance, the People's Bank of China disinfected banknotes in virus-infected areas, the Federal Reserve quarantined money, and the Reserve Bank of India advised people to use electronic payments instead of physical cash handling (Filipiak, 2020), which could speed up the spread of the virus (Sreelakshmi and Sangeetha, 2020). As the virus spread, more businesses embraced low-contact or contactless payment methods (Ardity, 2020), leading to the growing adoption of cashless transactions (Filipiak, 2020).

2.10. THE IMPACT OF FINTECHS

Innovations and changes in industries can have varying impacts on industry players. Some may benefit and gain a competitive edge, while others may lose their market share and be displaced. The financial services industry is no exception, with the emergence of fintechs bringing both opportunities and challenges that affect all stakeholders, including incumbent financial institutions, regulators, and customers (Daniel, 1999; Brown et al., 2004; Dirican, 2015; Gomber, Koch and Siering, 2017; World Economic Forum and Accenture, 2017). These changes are challenging the fundamentals of the industry and its entire value system (Leong et al., 2017).

Drasch, Schweizer, and Urbach (2018) and Elsaid (2021) assert that the emergence of new business models, customer demands, and technological advancements are changing various aspects of the financial industry, including product offerings, services, production processes, and organisational structures. These changes also empower consumers to have more control over their finances and disrupt traditional norms in the industry, as noted by Arner, Barberis, and Buckley (2017) and Anagnostopoulos (2018). However, the World Economic Forum and Accenture (2017) suggest that industry players embrace these changes as opportunities to enhance the industry, provide quality services to individuals and organisations, and improve

efficiency. Collaboration among stakeholders is crucial to creating a thriving ecosystem, as emphasised by Lee and Shin (2018).

Several authors have studied the impact of fintechs on the financial services industry in different parts of the world, particularly in developed countries. When investigating the impact of fintechs on the financial services industry, authors such as Gomber et al. (2018), Magnuson (2018), and Yanagawa (2018) discovered that fintechs are transforming businesses by creating new business models, innovative products and services that require little human involvement. Fintechs also lower cross-border transaction constraints, financial products and services costs and introduce new approaches to customer service and operational risk via new machine learning and artificial intelligence applications. This is supported by authors such as Lenz (2016), Vasiljeva and Lukanova (2016), Gomber, Koch and Siering (2017), Jagtiani and John (2018), Lin et al. (2018) and van den Broek and van Veenstra (2018), who discovered that fintechs also simplify financial products and provide convenience for the customers.

Studies by Thomas and Hendrick-Wong (2019; Zvirgzdina and Skadina (2019), Senyo and Osabutey (2020), Ky, Rugemintwari, and Sauviat (2021) support the argument that fintechs are impacting the financial services industry positively and contend that the other striking impact of fintechs is the extension of financial services to previously underserved or neglected consumers.

As good as it may sound, in doing so, fintechs are challenging the incumbents in several ways that include competition for resources (e.g., working capital), reducing the industry profits by offering low-cost financial services and products. This argument is supported by Hornuf and Haddad (2019), who also argue that these changes force the incumbents to transform their business models to remain competitive, which is suitable for improving the industry.

Other researchers have studied the impact of fintechs on the financial services industry in other countries. Elsaid (2021) studied the impact of fintechs on financial services globally. This study investigated the benefits and challenges that fintechs bring to the traditional banking system. Gibson (2015) studied the impact of fintech on the financial services industry in Ireland, Elia, Stefanelli, and Ferilli (2022) investigated the effect of fintechs in the banking industry, while

International Monetary Fund- African Department (2019) studied the impact of fintechs in Sub-Saharan African countries.

Other authors such as Zhou, Arner and Buckley (2018) investigated fintech regulation in China; Miskam, Yaacob and Rosman (2019) studied the evolution and regulation of fintechs and its impact in Malaysia; Alblooshi (2022) studied the evolution of fintechs and its effect on the financial services industry, and its role in sustainable development in the United Arab Emirates (UAE). Chikalipah (2020) studied the impact of mobile money in achieving Sustainable Development Goals (SDG) in Zambia, and Breidbach, Keating and Lim (2019) studied the transformational impact of fintech. Truong (2016) also studied the evolution of fintechs. In other studies, to investigate the impact of fintechs on the financial services industry, Eurosystem (2015) and Yanagawa (2018) observed that fintechs increase competition for the incumbent financial institutions and are doing away with some traditional business models.

Business leaders and regulators must comprehend fintech's impact to anticipate its disruptions. This may encourage consumers to adopt these technologies. During their annual meeting in 2018, the IMF and the World Bank Group introduced the Bali Fintech Agenda (BFA) as a comprehensive approach to addressing the impact of fintechs. It is a set of high-level issues that countries should consider when developing their domestic fintech policies to maximise the benefits of financial technology while minimising the risks. The BFA covers topics such as enabling fintech, ensuring sector resilience, addressing threats, and promoting international cooperation. It comprises 12 elements (Table 2-4) (International Monetary Fund, 2018). It is based on the need to understand how technological innovations impact financial services and their effects on efficiency, financial stability, integrity, and inclusion (International Monetary Fund, 2019).

Table 2-4 BFA elements: Balancing opportunities and risks (adapted from International Monetary Fund, 2018)

I. Embrace the opportunities of Fintech
II. Enable New Technologies to Enhance Financial Service Provision
III. Reinforce Competition and Commitment to Open, Free, and Contestable Markets
IV. Foster Fintech to Promote Financial Inclusion and Develop Financial Markets
V. Monitor Developments Closely to Deepen Understanding of Evolving Financial Systems
VI. Adapt Regulatory Framework and Supervisory Practices for Orderly Development and Stability of the Financial System
VII. Safeguard the Integrity of Financial Systems
VIII. Modernize Legal Frameworks to Provide an Enabling Legal Landscape
IX. Ensure the Stability of Monetary and Financial Systems
X. Develop Robust Financial and Data Infrastructure to Sustain Fintech Benefits
XI. Encourage International Coordination and Cooperation, and Information Sharing
XII. Enhance Collective Surveillance and Assessment of the Financial Sector

Fintechs offer various advantages, such as implementing innovative technologies that lower financial service expenses (Hwang and Christensen, 2008), providing market entry opportunities for non-banks (Buckley, Arner and Barberis, 2016), expanding market and customer reach (creating new markets) (Mazambani and Mutambara, 2019), catering to neglected customers (Jagtiani and Lemieux, 2018), and transforming business models (Mungai and Bayat, 2018; International Monetary Fund- African Department, 2019).

On the contrary, fintech companies have a negative impact on the business and financial services regulation of incumbent companies (Arner, Barberis and Buckley, 2017; Anagnostopoulos, 2018). The degree of influence varies depending on the type of innovation and the disruption source, as Chen and Robinson (2019) noted. Fintech companies can identify consumer needs and gaps in the market more quickly, leading to faster innovation and the creation of new business opportunities, which in turn affects the competitiveness of incumbent companies.

The following section highlights some of the significant impacts of fintechs on the financial services industry.

2.10.1. Business model transformation

The emergence of fintech has brought about new challenges for traditional financial institutions (Yanagawa, 2018). To survive, these institutions must modify their business models. Fintech companies offer high-quality products and services at lower prices (Hwang and Christensen, 2008), forcing traditional institutions to reduce costs to stay competitive. In addition, fintechs are introducing branchless financial services that eliminate face-to-face interactions with customers, which is a significant factor in upselling and cross-selling, commonly used by traditional banks (Singh, 2004). Losing the opportunity to cross-sell through face-to-face customer contact could negatively impact banks' profitability (Eurosystem, 2015).

In wealth management and investment sectors, technology brings new business models, making financial services accessible to a broader range of individuals whom traditional models would otherwise exclude. These innovative models permit people to invest small amounts far below the minimums established financial institutions require to qualify for their products (Magnuson, 2018). This development is a positive step for consumers, enabling more people to participate in the industry.

In accord with the World Economic Forum and Accenture (2017), fintech companies foster a flexible work culture that encourages creativity and promotes employee participation and engagement. This approach enables them to offer a unique combination of attributes that make them attractive to the job market and help them attract top talent. As reported by Gomber, Koch, and Siering (2017), this poses a significant threat to traditional financial institutions as they compete for resources across the entire value chain. In the future, incumbents may struggle to recruit and retain the best talent if these trends continue. Another significant advantage that fintechs have over traditional institutions is their ability to respond quickly and adapt to changing consumer needs (World Economic Forum and Accenture, 2017). This forces incumbent organisations to reinvent their business models to remain competitive in the evolving environment (Hornuf and Haddad, 2019).

Additionally, financial technologies powered by analytics, robotics, and artificial intelligence, offer the industry enhanced decision-making abilities (Jagtiani and Lemieux, 2018; Das, 2019) and cost-saving benefits (World Economic Forum and Accenture, 2017). In the lending and

insurance sectors, these technologies facilitate improved accuracy in risk assessment with new business models that evaluate consumer risks and manage claims (Eurosystem, 2015; Das, 2019; Miskam, Yaacob and Rosman, 2019).

Financial technologies powered by analytics, robotics, and artificial intelligence, offer improved decision-making skills to the industry (Jagtiani and Lemieux, 2018; Das, 2019), leading to increased efficiency and cost reduction (World Economic Forum and Accenture, 2017). These technologies are beneficial in the lending and insurance sectors, where they aid in accurate risk assessment, enabling new business models to assess consumer risks and handle claims (Eurosystem, 2015; Das, 2019; Miskam, Yaacob and Rosman, 2019).

2.10.2. Better Products and Services

Fintech companies are driving incumbents to enhance their business models and value propositions (Gomber, Koch and Siering, 2017; van den Broek and van Veenstra, 2018), resulting in improved products and services for the industry as a whole (Christensen, 2002; Block, 2013). These innovative firms are introducing new business models that offer customers a better service experience, more comprehensive product or service selection, and easy-to-use and convenient options (Lenz, 2016). For instance, mobile payments have revolutionised payment gateways and made them more accessible to people, while digital banks have given customers the flexibility to bank from anywhere at any time (Buckley, Arner and Barberis, 2016). This has helped to overcome the limitations of physical banking and allowed for greater convenience and accessibility (Lin et al., 2018).

In some instances, fintech companies come into play and simplify the services and products that the incumbents have made complicated. This leads to more affordable and accessible products for many customers (Jagtiani and Lemieux, 2018; Mazambani and Mutambara, 2019). Moreover, Vasiljeva and Lukanova (2016) highlighted that fintechs have played an essential role in offering personalised services and products tailored to each customer’s needs. This approach eliminates the use of a one-size-fits-all approach in service delivery.

Innovations greatly benefit companies as they improve their services and products, leading to increased sales (Christensen et al., 2015). Fintech innovations are no different and are crucial in enhancing customer experiences and increasing efficiency. Examples of such innovations include ATMs, mobile banking, and online banking services (Vasiljeva and Lukanova, 2016). By introducing cash machines, banks allowed customers to withdraw, deposit, and transfer money at their convenience, anytime, notwithstanding branch operating hours. Additionally, institutions often combine new technologies with old ones to enhance their products and services. For instance, banks effectively introduced online banking services, allowing customers to choose between visiting a branch or banking digitally (Enders et al., 2006).

In addition, the emergence of online lending platforms has provided a chance for those who are unable to obtain loans from conventional financial institutions. Crowdfunding is a prime example of this fintech innovation in which peer-to-peer is used to provide loans. It has greatly enhanced the accessibility of funds for individuals and small businesses. Unlike traditional financial institutions, crowdfunding is more customer-friendly, encouraging participation (Dhar and Stein, 2017). This fintech promotes financial democracy and inclusion for lenders and borrowers (Yu and Shen, 2019).

Using technology-driven credit modelling has significantly improved financial inclusion (Jagtiani and Lemieux, 2018). It has enabled specific borrowers to secure better loan ratings and lowered interest rates (Boratyńska, 2019). This has been made possible through advanced analytics platforms that utilise big data from the digital activities of individuals or small and micro-enterprises, resulting in quicker and more cost-effective credit assessments (Jagtiani and Lemieux, 2018; Das, 2019). In addition, financial technologies play a crucial role in lending by contributing to more robust credit risk profiling, which is critical to the lending industry (Wagner et al., 2016).

2.10.3. Creation of new markets (diversity) and financial inclusion

In stagnant or slow-growing markets, businesses often need more support and must seek new ways to stay competitive. However, many companies tend to adopt similar strategies as they try to outcompete each other based on shared beliefs and perceptions about customers, product features, and industry standards (Kim and Mauborgne, 2005). This often leads to price

reductions and excessive product improvements, resulting in low-profit margins. This approach, popular in the 1980s, can also lead to high-end products being sold at abnormally low prices (Mauborgne and Kim, 1999).

Contrarily, during the 1990s, competition among companies revolved around their ability to create innovative products and services for new markets, as pointed out by Hamel and Prahalad (1991). This approach, as suggested by Mauborgne and Kim (1999), enabled companies to expand beyond saturated markets. Financial institutions have leveraged the internet and technology to capitalise on this strategy by developing new technologies that offer fresh business prospects, broaden markets, and surpass previously established boundaries (Zvirgzdina and Skadina, 2019).

These technological advancements have opened new avenues for accessing markets previously ignored by traditional institutions, as argued by Senyo and Osabutey (2020). For instance, fintechs have facilitated financial inclusion in emerging markets by providing banking services to previously unbanked customers. This is especially true for individuals living in remote areas where traditional banks cannot open branches due to a lack of infrastructure. In addition, the introduction of mobile payment and money transfer platforms has decreased the importance of banks in the financial services value chain, according to Buckley, Arner, and Barberis (2016). For instance, M-Pesa, a mobile money service, has been instrumental in Kenya's financial inclusion in the past decade by penetrating the unbanked market and reaching over 75 percent of the population (Thomas and Hendrick-Wong, 2019; Ky, Rugemintwari, and Sauviat, 2021).

2.10.4. New regulatory risks

The financial services industry has experienced numerous unforeseen and rapid transformations due to the emergence of fintechs. These changes have positively impacted consumer behaviour, services, and products, while presenting new regulatory hurdles (Kaal and Vermeulen, 2016). Consequently, there is much uncertainty surrounding fintechs (Tsindeliani et al., 2022), partly because the traditional regulatory framework does not cover them (Nguyen, Tran and Ho, 2021). This has led regulators to consider developing new regulatory frameworks because the old frameworks are inadequate in addressing the changing landscape, pursuant to Didenko (2018) and Yanisky-ravid and Hallisey (2019).

To this end, fintechs must be adequately regulated to not cause instability in the financial services industry (Nguyen, Tran and Ho, 2021). Experts suggest that regulators must establish new regulations to address cybersecurity, money laundering, and other concerns that are emerging because of fintechs while prioritising customer safety (Coetzee, 2018). Manta and Pop (2017) and Magnuson (2018) agree and recommend expanding the scope of regulations to encompass fintechs. However, implementing new regulatory approaches may not be a simple task, as demonstrated by the challenges faced in other countries. International Monetary Fund (2019) lists these challenges:

- Regulating fintech activities, services, and products remains challenging due to limited experience in many countries. This is especially true for emerging fintechs like cryptocurrencies, peer-to-peer lending, insuretech, robo-advisory, algorithmic trading, and artificial intelligence-driven lending.
- In certain countries, particularly those with emerging economies, resources may be lacking to facilitate sufficient regulatory responses and develop necessary capabilities. This predicament could result in foregoing fintech advancements and opting for the financial stability the conventional financial services sector offers.
- Many are worried about the potential for regulatory arbitrage across borders. Regulators have stressed the significance of establishing international standards for regulating and supervising fintech companies and their activities. Nonetheless, these standards are still nascent, even in more established industries.
- As the reliance on technology increases, it has become increasingly important to address the risks associated with cyber and operational factors (including third-party risks). These risks are among the most critical ones to manage. There is a significant disparity in managing cyber risk between developed and underdeveloped countries, highlighting that there is a huge need to build capacity to support the development of more robust frameworks.

2.10.5. Impact of Blockchain and Cryptocurrencies

There are differing opinions on the impact of blockchain and cryptocurrencies. One viewpoint sees the rise of virtual currencies as a positive development for financial services. This is evidenced by the significant returns early investors in Bitcoin have enjoyed over the years. According to Manta and Pop (2017), an individual who invested in Bitcoin in 2013 saw their investment grow by 6,978 percent by 2017. This trend has continued, with the price of one

Bitcoin reaching $65,000 in November 2021. During the same period, an investment in the S&P 500 grew around 60 percent, in contrast. Virtual currencies offer multiple advantages such as reduced transactional costs, the ability to transact across borders, elimination of counterparty risk assessment, access to money for individuals without bank accounts, ledger transparency (where a complete audit trail is available to all participants), partition resistance, and Byzantine fault tolerance (Manta and Pop (2017, and Varma (2019).

Cryptocurrencies such as Ripple can solve the increasing demand for faster, more accessible, and cost-effective payment systems in developing regions. Hashemi Joo, Nishikawa and Dandapani (2019) maintain that Ripple has the potential to positively impact the lives of billions of individuals with limited financial resources, particularly in emerging markets. Such markets comprise approximately 85 percent of the global population and contribute significantly to the global gross domestic product (GDP) (Lagarde, 2016).

Conversely, some experts believe that the rise of cryptocurrencies poses significant challenges to the financial services industry. As stated in Kiran and Stannett (2014), security and trust are among the top concerns. Other studies, such as those by Karame, Androulaki and Capkun, 2012; Heilman et al. (2015), have also highlighted vulnerabilities in Bitcoin's blockchain that could lead to attacks. Additionally, Karame (2016) has raised concerns about the limited control of certain entities over Bitcoin's decision-making, mining, and incident resolution processes, which could potentially result in the devaluation of Bitcoin without warning.

Bitcoin is becoming increasingly popular for "fast payment" situations, such as online services, ATM withdrawals, and vending machine payments. However, this use in fast payments has been identified as a potential risk for double spending (Karame, Androulaki and Capkun, 2012). These authors argue that even measures like the Bitcoin PoW-based time-stamping mechanism, which prevents adversaries from using coins for more than one payment, may not always combat double spending. This mechanism is best suited for slow payments, like online orders with physical goods delivery, as it takes several minutes to confirm a transaction.

Cryptocurrencies have posed numerous questions for regulators regarding their tax implications. To address this, Solodan (2019) notes that global regulators are currently investigating the taxation of cryptocurrency gains. Cryptocurrency sales in the USA and UK are subject to capital gain tax, which is considered capital asset. On the other hand, South Africa's tax authorities view cryptocurrency transactions as "normal cash transactions" and mandate their reporting on the Provisional Tax return (IRP6). Short-term trading activities are considered income for tax purposes, while long-term investments (usually over three years) are subject to capital gains taxes (South African Revenue Service, 2018).

2.11. RESPONSES TO THE DISRUPTION BY FINTECHS

Innovation often brings significant changes to industries, and these changes can sometimes hurt incumbent businesses, the industry and industry regulators. Considering this, the incumbents need to safeguard their market share, while regulators are responsible for balancing industry stability and promoting progress through innovation (Coetzee, 2019). Both incumbents and regulators must respond carefully to these changes to ensure continued competitiveness (Charitou and Markides, 2003).

As mentioned by several authors, including Gomber et al. (2017, Hornuf and Haddad (2019), Singh (2004) and Yanagawa (2018), fintech companies are posing significant challenges to traditional financial institutions. This is a common occurrence as introducing new technologies often brings unknown risks and challenges for industries and economies. Similar disruptions have been seen in other industries, such as online retailers like Amazon disrupting the retail sector and Uber challenging traditional metered taxis by capturing a significant market share and impacting their profitability.

Studies by Kaal and Vermeulen (2016), Didenko (2018), Yanisky-Ravid and Hallisey (2019), Nguyen, Tran and Ho (2021), and Tsindeliani et al. (2022) have shown that the emergence of the fintechs has not only introduced challenges for the incumbents but has introduced new regulatory risks as well. These risks arise because some fintechs fall outside the traditional regulatory scope. A study by Jagtiani and John (2018) supported this and showed that fintechs disrupt the industry and create new regulatory risks.

For the industry's stability, regulators must find ways to regulate the fintechs to minimise this negative impact. Studies by Buckley, Arner and Barberis (2016), Ng and Kwok (2017), Anagnostopoulos (2018), Coetzee (2019) and Miskam, Yaacob and Rosman (2019) emphasised the importance of regulating fintechs to maintain the stability of the industry. These studies assert that regulators must create an environment that supports innovation while ensuring that fintechs are regulated. As part of the regulatory approach, Fung et al. (2020) investigated the use of regulatory sandboxes to regulate fintechs and found this intervention beneficial to the new entrants and the industry. Studies by Sangwan et al. (2019) and Cliffe Dekker Hofmeyr (2020) also support the use of sandboxes as a strategy to regulate fintechs. These authors contend that sandboxes provide an environment that allows new entrants to innovate without negatively affecting the industry.

Several authors have investigated how incumbents respond to the disruption by fintechs in Europe, Asia, and America. To mitigate the negative impact of fintechs on the incumbents, Yanagawa (2018) advised that the incumbents should find innovative ways to deal with the disruption. Lee and Shin (2018) assert that incumbents should consider integrating fintechs into their business models by acquiring fintechs or partnering with them. Dranev, Frolova and Ochirova (2019) explored the role of fintechs in mergers and acquisitions, Turcan and Deák (2021) examined the relationship between fintechs and incumbents in Canada, Saksonova and Kuzmina-Merlino (2017) did a study which compared the effects of fintechs versus traditional financial services institutions. Łasak and Gancarczyk (2021) and (Thakor, 2020) investigated the transformational impact of fintechs and their relationship with traditional banks. These studies exposed the benefits of acquiring and forming alliances with fintechs as part of a response strategy to overcome the negative impact of fintech disruption and help incumbents thrive.

2.11.1. Responses by incumbents

In the manner of Charitou and Markides (2003), when new innovations emerge, incumbents should avoid rushing to react without careful and creative consideration. Yanagawa (2018) advises them to think thoroughly about how to respond effectively. As the rise of the fintechs continues threatening the incumbent financial institutions, the incumbents should not react haphazardly. If they respond unwittingly, they could end up wasting valuable resources. If

they reply in time or respond at all, they might stay within the innovation curve and avoid being displaced by innovative new entrants or competitors. Therefore, incumbents should carefully observe the changes and respond wisely, because Charitou and Markides (2003) caution that the decision of the incumbents' leaders whether to respond or to disregard the disruption has a significant impact on the future of their organisations.

Surviving disruption is mainly under the control of companies and their leadership tactics. As stated in Christensen (1997), effective management and leadership styles are crucial to an organisation's survival. Charitou and Markides (2003) agree, stating that an organisation's ability to respond to disruption is influenced by factors such as resources available for responding, expertise within the incumbent, and the magnitude of the threat the innovation poses to the incumbent's business. The motivation to respond is driven by innovation growth and its threat to the core business. Additionally, the leadership's perception of the disruption determines an organisation's response approach. If they view it as a significant threat, adequate resources are allocated for a response. Conversely, if they see it as insignificant, resources are insufficiently allocated or not given at all (Clark Gilbert, 2002). Charitou and Markides (2003) and Eurosystem (2015) suggest different strategies that could help companies respond to technological innovations:

- Ignore innovations and focus on their traditional business.
- Adopt the innovations and integrate them into their business models.
- Embrace innovations completely and scale them up.

In accord with a study conducted by Lee and Shin (2018), incumbent financial institutions have adopted six ways to respond to fintechs, which align with the second and third response strategies mentioned above:

- Partnering with fintechs and outsourcing fintech services from fintechs.
- Providing venture capital to fintechs.
- Incubating and accelerating fintech startups.
- Acquiring fintechs.
- Developing own internal fintech divisions.

These strategies will be discussed briefly in the following section.

Ignore the innovation and focus on the traditional business: It is dangerous for organisations to ignore disruptors, as this approach can lead to their eventual displacement and demise (Charitou and Markides, 2003). For instance, some industry players who chose this approach during the revolutions of the hard disk drive and film industries suffered dire consequences. In the hard disk drive industry, companies that failed to adapt to changes were wholly displaced by innovative competitors and new entrants (Christensen, 1997). Likewise, once-powerful Kodak was displaced in the film industry and had to file for bankruptcy because they hesitated too long to shift from chemical film processing to innovative digital printing (Christensen, 1997; Assink, 2006).

Adopt the innovation by playing both games at once and fully adopt innovation: Incumbents need to respond positively to fintechs, but they need to be cautious in their approach to avoid disrupting their profitable business. Pursuant to Christensen et al. (2015), incumbents must handle disruption effectively by investing in sustaining innovations and focusing on improving their products and services to meet the changing needs of mainstream customers. Overreacting and committing all their resources could lead to the destruction of a profitable business. Therefore, companies must cultivate good customer relationships and respond to innovation carefully.

Companies should consider creating separate divisions or innovation laboratories focused on new technologies to keep up with the fast-paced market. As suggested by Christensen et al. (2015) and supported by Wagner et al. (2016), these divisions should be separated from the company's core business and equipped with dedicated fintech teams and flexible governance structures. This would help improve decision-making and speed up the adoption of new technologies. Financial institutions can use these divisions to scan for new technologies, following in the footsteps of IBM, which used a similar strategy to survive and evolve in the information technology industry. IBM operated two plants to conduct its business, one in Poughkeepsie for mainframes and another in Rochester, Minnesota, for minis (Denning, 2016).

Acar and Çitak (2019) add that incumbents should integrate fintechs into their core businesses. This can be achieved by forming strategic partnerships with fintech companies (Wagner et al., 2016) or by acquiring fintech companies to benefit from their expertise. Another approach is

for established companies to incubate fintech organisations, which can be mutually beneficial. In this scenario, established companies provide support and capital (Oshodi et al., 2017) while gaining access to the innovative abilities of the fintechs. Such collaborations allow partners to share knowledge and expertise. Fintech organisations bring their customer-centric approach, agility, and technology expertise. In contrast, established companies bring experience, brand equity (Camarate and Brinckmann, 2019), their large and established customer base, and distribution networks (Holmes and King, 2019).

Embrace innovations completely and scale them up: Eurosystem (2015) recommends that incumbents companies introduce new technological advancements to the market. Charitou and Markides (2003) echo this sentiment, suggesting that incumbents sometimes must abandon their current business models and fully embrace new technologies. This approach entails not just copying the innovation but scaling it up and turning it into a widely used product. This strategy is particularly effective for established companies, as they are typically better equipped than new players to bring innovations to scale. Furthermore, Christensen et al. (2015) contend that incumbents are well-positioned to create products and services that cater to mass markets, thanks to their established distribution networks and financial resources that aid business growth.

In accordance with Charitou and Markides (2003), successful innovation requires pairing new technology with market creation. However, these tasks often require different skill sets and can be performed by different organisations. One organisation can introduce technology into an industry while another scales the reins. In this way, innovative ideas from fintechs can be replicated and expanded upon. Charitou and Markides (2003) use the example of online stock trading to illustrate this point. They remind us that scaling up online stock trading was not accomplished by the same company that introduced it. Online-based stock trading was launched by a partnership of Howe Barnes Investments and Security APL with Net Investor, while Charles Schwab scaled it up six years later.

2.11.2. Responses by regulators

As the financial services industry moves towards the digital age and becomes more innovative, and financial technologies become more advanced; the regulatory and legislative framework must be flexible and adaptable to these developments and provide an enabling environment that encourages innovation (Deloitte, 2022) and does not stifle it (Coetzee, 2019). Anagnostopoulos (2018) suggests that it is essential for regulation to work together with innovation and industry developments. This means monitoring potential risks and regularly evaluating whether intervention is necessary or if it is better to allow evolution to occur. Regulators, incumbent companies, and new players must collaborate and understand how innovations will impact the industry's risk profile.

The South African Reserve Bank (2018b) posits that regulators should avoid prematurely regulating innovative technologies as it may impede their progress and potential benefits. Only when the risks associated with disruptive technology become destabilising and cross a systemic threshold should regulators intervene. To that end, scholars such as Buckley, Arner, and Barberis (2016) and Gomber et al. (2018) concur that regulatory bodies face a challenge in balancing the need to encourage innovation and competition while safeguarding consumers from risky behaviour and maintaining market stability.

Miskam, Yaacob and Rosman (2019) add that regulators must establish clear regulations and minimum standards for stability and security customised for the fintech market. Failure to do so could lead to panic among consumers and a loss of confidence in the industry. Ng and Kwok (2017) suggest implementing a risk-based approach and training industry workers to mitigate potential threats while embracing fintech. Such precautionary measures can go a long way in ensuring compliance and maintaining consumer trust.

In support, Buckley, Arner and Barberis (2016) suggest that to ensure the long-term success and acceptance of fintechs among consumers, adopting a more innovative and experimental regulatory approach towards regulating this industry is necessary. One effective way to accomplish this goal is by implementing regulatory sandboxes. These sandboxes resemble partially controlled testing areas, like the clinical trials commonly implemented in the healthcare and pharmaceutical industries (Cliffe Dekker Hofmeyr, 2020). Sangwan et al.

(2019) agree and argue that sandboxes provide an ideal environment for startups to incubate their ideas. This ensures a balance between the freedom to innovate and necessary consumer protection. Startups can experiment without being weighed down by excessive regulations. Regulatory sandboxes also offer a chance to test innovations more efficiently by temporarily avoiding typical licensing requirements and allowing regulators to create appropriate rules for new technological offerings. Ultimately, sandboxes help balance innovation and regulation (Cliffe Dekker Hofmeyr, 2020).

The rise of virtual currencies has increased the demand for fintech regulation. With over 850 unregulated virtual currencies in circulation, concerns have been raised about their potential use in unethical and criminal activities such as money laundering and terrorist financing (Manta and Pop, 2017; Magnuson, 2018). The European Central Bank, International Monetary Fund, and Bank for International Settlements have identified these risks. To address this issue, the European Parliament and Council are amending Directive (EU) 2015/849 to include virtual currencies in their regulations (Manta and Pop, 2017).

In the manner of Gomber et al. (2018), setting regulatory guidelines for fintechs is a difficult feat, just like it has been with other financial services innovations. It must be done accurately. As a result, the International Monetary Fund (2019) has outlined essential areas requiring international collaboration. These encompass the IMF and World Bank's roles, such as emphasising cybersecurity, combating anti-money laundering and financing of terrorism (AML/CFT), establishing legal, regulatory, supervisory frameworks, payment and securities settlement systems, and cross-border payments.

Effectively tackling the challenges brought about by fintechs in the financial services industry, such as regulatory risks, could prove pivotal in promoting the adoption of these technologies by consumers which has been a major challenge despite substantial investment in fintechs.

2.12. ADOPTION OF FINTECHS BY CONSUMERS

2.12.1. Introduction

Although financial institutions have made significant investments in fintechs, the adoption rate is still lower than anticipated (Zhou, Lu and Wang, 2010; Yu, 2012; (Gunawan, Sinaga and WP, 2019), particularly in developing nations (Mazambani and Mutambara, 2019; Sharma, Singh and Sharma, 2020). Therefore, it is crucial to examine the reasons behind the reluctance of consumers to adopt these technologies and identify the factors that drive individuals to embrace them (Savić and Pešterac, 2019).

Studies on technology adoption have identified key elements that impact people's inclination to use different technologies (Al-Saedi et al., 2020). Various models have been developed to comprehend these factors (Yang, 2009). The two most notable models, as stated by Gunawan, Sinaga and WP (2019), are the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, 2003).

2.12.2. Technology acceptance models

Davis (1989) presented the Technology Acceptance Model. According to this model, an individual's willingness to use technology is influenced by two key factors: perceived usefulness and perceived ease of use. Perceived usefulness relates to the belief that technology can enhance job performance, while perceived ease of use refers to the idea that using technology will require minimal effort (Davis, 1989; Venkatesh and Davis, 2000). The TAM model suggests that external factors such as technology features, development process, and training play a role in determining the intention to use technology. However, this is mediated by perceived usefulness and ease of use. Additionally, the model proposes that perceived usefulness is linked to perceived ease of use, as more straightforward usage is seen to increase the overall effectiveness of the technology (Davis, 1989).

Venkatesh and Davis expanded the TAM model in 2000 by introducing additional constructs, resulting in the TAM2 model. In accordance with TAM2, subjective norms - the belief that an important person or group will approve and support a particular behaviour - have a significant direct effect on a technology's purpose of use, in addition to the perceived usefulness and ease of use. Subjective norms impact perceived usefulness through internalisation, as people integrate social influences into their perceptions of usefulness and identification. By utilising

this mechanism, individuals seek to enhance their job efficiency and gain prestige and power within the working community (Venkatesh and Davis, 2000). As a result, individuals typically prefer technology that is easy to use and beneficial to their needs.

Some academics, such as Ajibade (2019), question the comprehensiveness of the TAM model due to its limitations. The model has shortcomings, such as its inability to provide comprehensive insights into how people perceive new technologies and its failure to consider specific indicators and external factors that affect perceived ease of use and usefulness (Lou and Li, 2017). Furthermore, the model neglects to explore the connection between usage attitude and usage intention (Chao, 2019) and may not apply to all new technology adoption instances (Lou and Li, 2017). As a result, the UTAUT model was developed to integrate different viewpoints on consumer acceptance and innovation, creating a more cohesive paradigm for emerging technology adoption literature (Williams, Rana and Dwivedi, 2015).

The UTAUT theory is an integration of eight models and prominent theories, such as the theory of reasoned action (TRA), innovation diffusion theory (IDT), the theory of planned behaviour (TPB), the TAM; the combined TAM-TPB, the motivational model (MM), the model of PC (personal computer) utilisation (MPCU), and social cognitive theory (SCT) (Venkatesh, 2003; Williams, Rana and Dwivedi, 2015; Chao, 2019; Gunawan, Sinaga and WP, 2019). Its central argument is that technology adoption is affected by four core constructs: performance expectations, effort expectations, social influence, and facilitating conditions. These constructs directly determine usage intention, behaviour, and user actions. Gender, age, experience, and voluntariness are other variables that moderate the influence of the four primary constructs on usage intent and behaviour (Figure 2-11).

The adoption by consumers relies heavily on these four crucial factors. Firstly, they assess whether the technology will benefit them in any way. If they do, they are likely to use it. Secondly, they evaluate the effort required to use the technology. They may be put off if it is too much, but if it is minimal, they may be more inclined to use it. Thirdly, people are social creatures and are often influenced by their peers, family, and respected members of society. This can affect their decision to adopt a technology. Finally, individuals must have the right

technical infrastructure to use technology successfully. With it, they are likely to accept the technology.

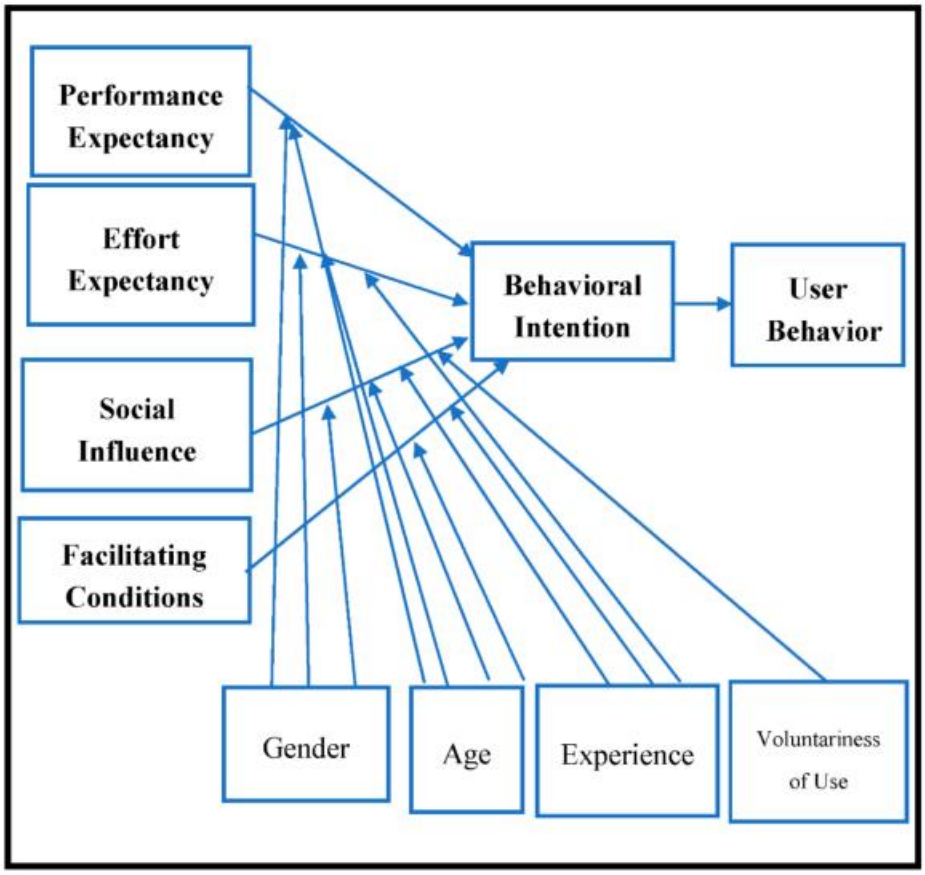


Figure 2-11 UTAUT model (adapted from Gunawan, Sinaga and WP, 2019)

Scholars studying technology adoption have utilised different models to analyse how consumers adopt new technologies (Yu, 2012). Studies indicate that the UTAUT model is the most impactful model (Hoque and Sorwar, 2017) and offers a deeper comprehension of the factors that affect a person's intention to use new technology (Venkatesh, 2003; Savić and Pešterac, 2019). This has led to the development of multiple models that build upon UTAUT to examine whether additional factors significantly impact consumers' adoption of fintech. These constructs include social influence, perceived financial cost, performance expectancy, perceived credibility (Yu, 2012), mass media and interpersonal influence (Suoranta and Mattila, 2004). Additionally, scholars have researched a broader range of variables, including the level of consumer awareness (Laforet and Li, 2005); trust (Koufaris and Hampton-Sosa, 2004; Tang et al., 2004; Shin, 2009); perceived advantages, the opportunity to try out fintechs,

perceived risk (Brown et al., 2003; Lee et al., 2003). Studies have demonstrated that credibility (Amin et al., 2008; Tang et al., 2004), convenience (Kim et al., 2015), and perceived security (Shin, 2009) are crucial factors that influence individuals to adopt financial technologies.

Factors such as government support, user innovativeness, and brand image have an impact on consumers' willingness to adopt new technologies (Hu et al., 2019). In their extension of the UTAUT model, Sharma, Singh and Sharma (2020) incorporated perceived risk, customer satisfaction, and two of Hofstede's cultural dimensions - individualism vs collectivism and uncertainty avoidance. They proposed that uncertainty avoidance diminishes the influence of performance expectancy and facilitating conditions on the intention to adopt internet banking. Sharma, Singh and Sharma (2020) emphasised the significance of an individual's cultural values in promoting internet banking adoption. Im, Hong and Kang (2011) study also revealed the effect of culture on technology adoption. Their research established that the impact of cultural variables in UTAUT varies across countries.

The UTAUT model has been enhanced by introducing new elements such as task technology fit (Zhou, Lu and Wang, 2010), initial trust, and facilitating condition (Afshan and Sharif, 2016; Queiroz and Fosso Wamba, 2019). Zhou, Lu and Wang (2010) suggested that how consumers view the technology and how well it fits with their task impacts their adoption of financial technology. Chong et al. (2019) expanded on this by stating that the decision to use fintech for banking transactions is influenced by factors such as a user-friendly system interface and clear instructions.

To adapt the UTAUT model from an organisational context to a consumer context, Venkatesh, Thong and Xu (2013) added elements such as hedonic motivation, price value, and habit, resulting in the development of UTAUT2 (Figure 2-12).

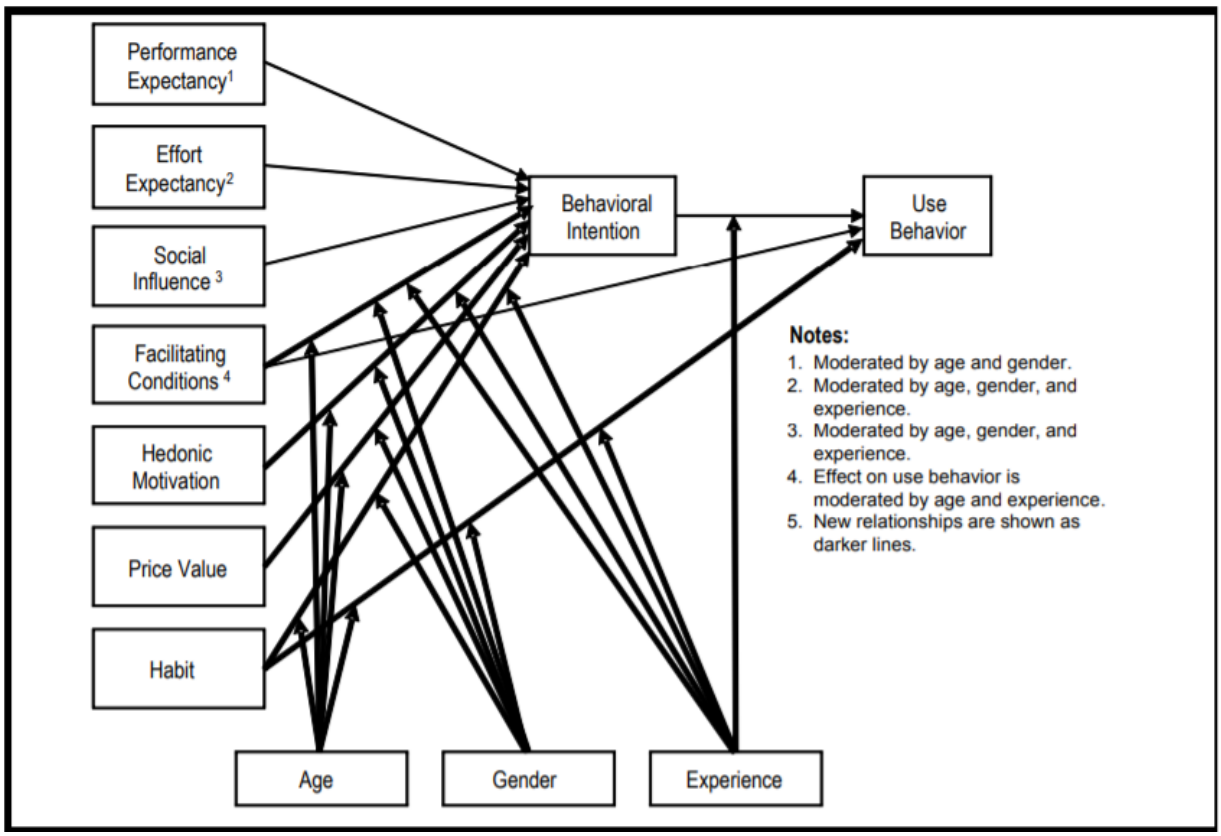


Figure 2-12 UTAUT2 model (adapted from Venkatesh et al., 2012)

2.13. CONCEPTUAL FRAMEWORK

The conceptual framework of this study (Figure 2-13) shows the relationship between the different role players in the financial services industry- fintechs, incumbents, regulators and customers as discussed in the literature review.

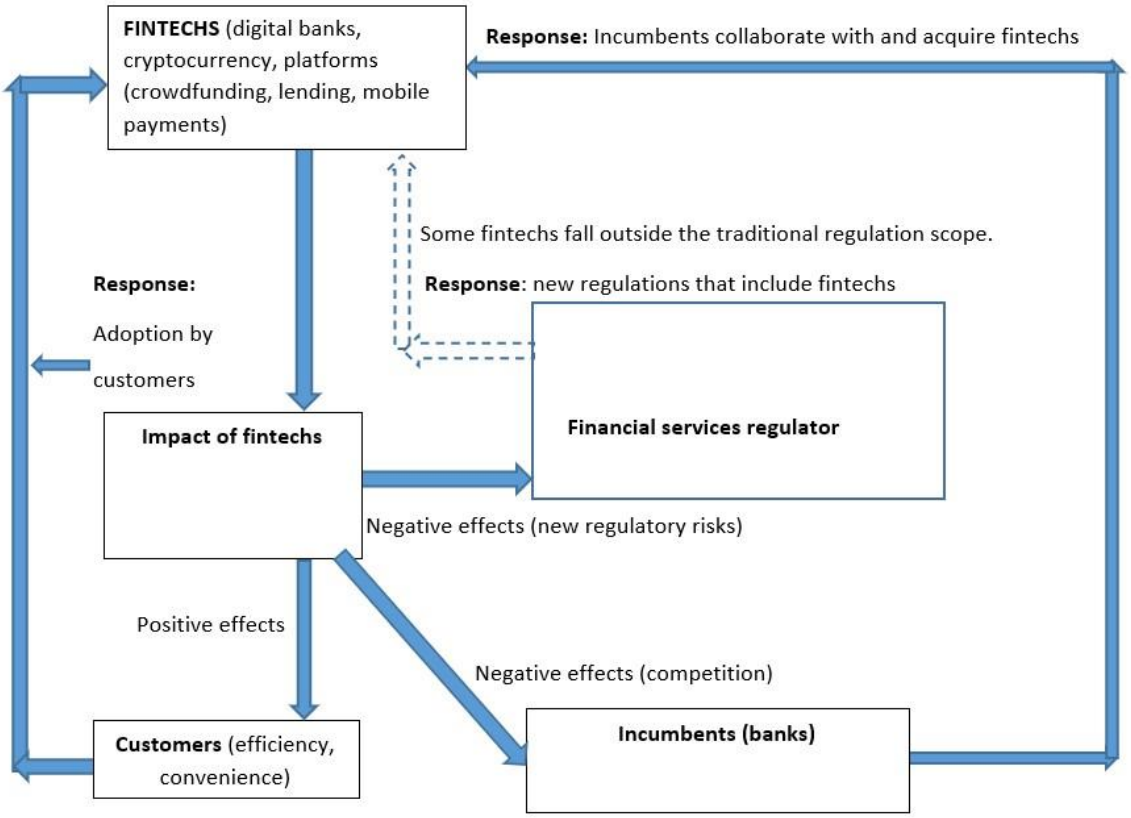


Figure 2-13 Conceptual framework (Author's creation, 2019)

The data presented in this figure implies that financial technologies have varying impacts on the different stakeholders in financial services. Incumbent businesses are affected both positively and negatively, regulators are impacted negatively, and customers are affected positively. Regulators are currently facing a dilemma as traditional regulations do not apply to fintechs. This necessitates the development of new regulations that include these emerging technologies. Incumbents risk losing their market share to fintechs and must find ways to respond accordingly. On the other hand, fintechs have a positive impact on customers-improving services, and products, and bringing convenience and efficiency. Ultimately, if customers are satisfied with fintech offers, they are more likely to adopt financial technologies.

2.14. CONCLUSION

This chapter discussed the literature associated with this study. It discussed the research context, theories which underpin the study, innovation in reference to this study, the evolution of fintechs, most common fintech types, fintech drivers, impact of fintechs, response strategies to fintechs disruption, adoption of fintechs by consumers and the conceptual framework of the study.

Based on a review of literature, industries aim for innovation to enhance their competitiveness, like the concept of natural selection in biological evolution. Various theories, including Marxist, creative destruction, and disruptive innovation, have significantly impacted innovation in different industries.

The impact of innovative technologies has been felt across various industries, including the financial services sector. Numerous advancements, such as fintechs, have resulted in significant changes in this industry. These technologies have improved efficiency, convenience, accessibility, reduced costs, and enhanced products and services. The revolution has been driven by various factors, such as the internet, artificial intelligence, machine learning, big data, and robotics. The emergence of the COVID-19 pandemic in late 2019 has also been seen as a driving force that will speed up the adoption of digital business models, such as fintechs.

The rise of financial technologies has brought about both advantages and regulatory challenges. Regulators must implement laws to regulate fintechs, while traditional financial institutions face increased competition and uncertainty on how to respond.

Based on the literature review, it has been noted that the adoption of fintechs is not as robust as expected. Nonetheless, the fintech industry is set to witness a significant positive transformation due to the emergence of new consumers from generations X and Y who are digital natives. These consumers have distinct expectations and preferences, with convenience and speed being their utmost priorities. Consequently, the adoption of fintech solutions is anticipated to accelerate thanks to this shift in consumer behaviour.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. INTRODUCTION

The previous chapter delved into the impact of financial technologies on the financial services industry. Through a literature review, the changes by fintechs were explored, with some experts viewing them as advantageous while others consider them to pose several challenges. The literature review highlighted several positive changes, such as improved products and services, faster and customer-oriented financial services, financial inclusion, new markets, the transformation of industry business models, and reduced costs. However, the literature review also showed that fintechs also challenge the fundamentals of the financial services industry by increasing competition for incumbents and introducing new regulatory risks.

The preceding chapters showed that the financial services industry is undergoing significant changes, piquing business leaders' and scholars' interest. To this end, many questions have arisen, related to the impact of fintechs on financial services, how incumbents and regulators adapt to fintech disruption, and whether fintechs will have disruptive consequences in an emerging economy like South Africa. Additionally, experts are exploring the future competitive landscape for the sector and the factors that influence customers to use fintechs. These topics continue to be a widespread discussion among academics and industry leaders.

To help answer these questions, this chapter will explore the methods, procedures, and strategies used to investigate the impact of fintechs in the financial services industry in South Africa and the factors influencing consumers to adopt fintechs in South Africa. As Khan (2014) outlined, research methodology is a master plan detailing the methods and steps to answer research questions. It provides a clear and concise approach to collecting information, sources, and techniques. Ade Bilau, Witt, and Lill (2018) also emphasise that research methodology lends credibility to the procedural framework used in generating research data and analysis for knowledge creation. The "research onion" diagram (Figure 3-1) illustrates the research methodology, which explains the reasoning behind selecting techniques and procedures for data collection and analysis.

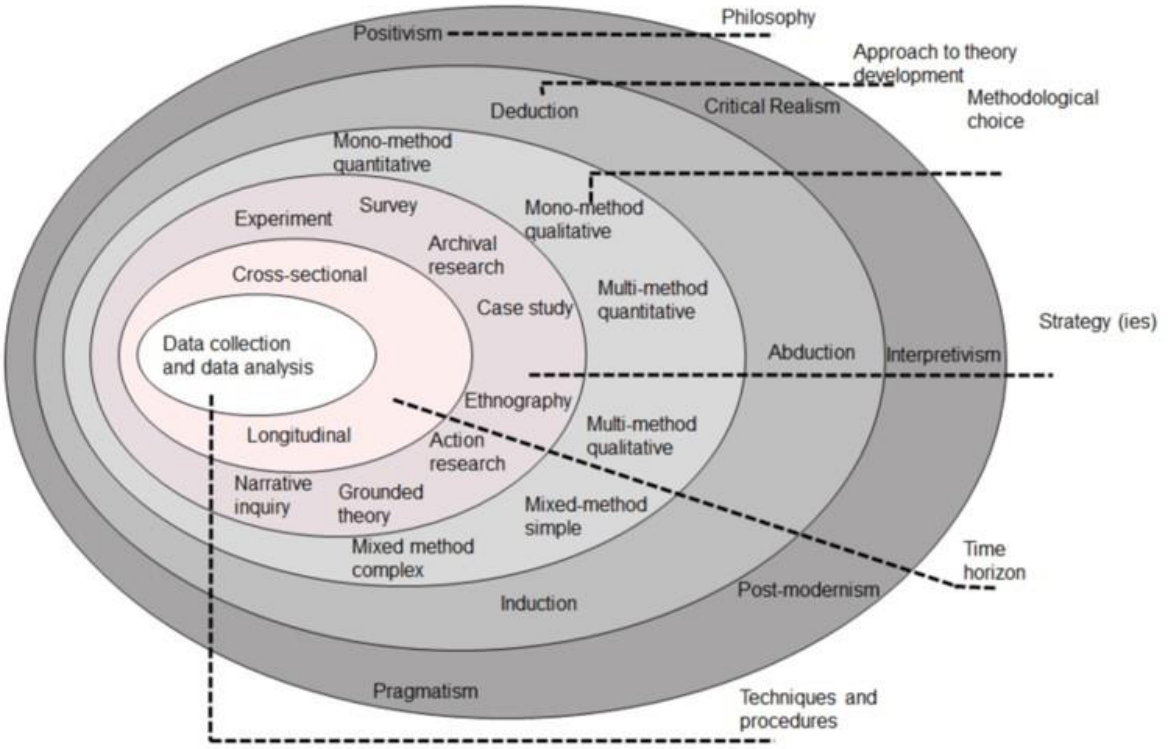


Figure 3-1 The research onion (adapted from Saunders et al., 2019)

This study utilised a mixed methods research design to answer its research questions. Specifically, a qualitative approach was employed to investigate the impact of fintechs on the financial services industry in South Africa (focus area one), as well as the factors influencing consumer adoption of fintechs in the country (focus area two). Meanwhile, a quantitative design was utilised to develop a fintech adoption model for South Africa and to triangulate the results of the qualitative investigation. To gather insights from industry experts, the researcher interviewed eighteen experts working in financial services institutions, including those in financial regulation, incumbents, and fintechs. The researcher aimed to gain insights from their lived experiences. The population of interest included the thirty-two banks that are part of the Banking Association South Africa, regulatory organisations that are members of the Intergovernmental Fintech Working Group (IFWG), and fintechs that are likely to significantly disrupt the South African financial services industry, according to Price Waterhouse Coopers (2016). The data collected were analysed using Atlas.ti 22 and thematic analysis. Once the qualitative data collection was completed, a quantitative design was employed to enrich and confirm the qualitative results, with twenty-two additional industry experts completing a questionnaire.

To investigate factors influencing fintech adoption in South Africa, the researcher interviewed seventeen customers who held bank accounts with various banks in the country and eighteen industry experts. Using Atlas.ti 22 and thematic analysis, the researcher analysed the data collected from these interviews to identify the factors influencing customers to adopt digital-only banks. These factors were used to formulate hypotheses for the quantitative analysis. The quantitative analysis was used for triangulation and to create a framework for fintech adoption in South Africa.

Before each interview, the participants were provided with an informed consent form (Appendix A). The form included information stating that their participation was voluntary and that they could withdraw at any time. Additionally, the researchers emphasised their commitment to maintaining the confidentiality and privacy of the participants.

The research methodology of this research is discussed in detail in the ensuing section.

3.2. RESEARCH PHILOSOPHY

The outermost layer in the research onion diagram represents the research philosophy, the framework used to acquire knowledge. It encompasses the researcher's beliefs about the world, influencing the research strategy and methods utilised to answer research questions (Bahari, 2010). The research philosophy focuses on the origin, nature, and creation of knowledge and assists in selecting appropriate research methods (Ade Bilau, Witt and Lill, 2018). The choice of philosophy is determined by the researcher's perception of knowledge and its development process (Saunders, Lewis and Thornhill, 2009). These perceptions include ontology, epistemology, and axiology, as depicted in Table 3-1 (Saunders, Lewis and Thornhill, 2019). Researchers employ philosophical assumptions that shape their decisions regarding study objects, methodology, and conclusions (Armstrong, 2019).

Table 3-1 Philosophical assumption with implications for practice (adapted from Creswell, 2007)

Assumption	Question	Characteristics	Implications for practice (examples)
Ontological	What is the nature of reality?	Reality is subjective and multiple, as seen by participants in the study.	Researcher uses quotes and themes in in words of participants and provides evidence of different perspectives.
Epistemological	What is the relationship between the researcher and that being researched?	Researchers attempts to lessen distance between himself or herself and that being researched.	Researcher collaborates, spends time in field with participants, and becomes an "insider".
Axiological	What is the role of values?	Researcher acknowledges that research is value-laden and that biases are present	Researcher openly discusses values that shape the narrative and includes his or her own interpretation in conjunction with the interpretations of participants.

Ontology: Ontology is the study of being, as defined by Ade Bilau, Witt and Lill (2018), or the philosophy of assumptions about reality's nature, as defined by Mason (2002). These assumptions shape a researcher's perception of their research and objects of study, ultimately guiding the direction of their research, as explained by Saunders, Lewis and Thornhill (2019). Ade Bilau, Witt, and Lill (2018) outline two ontological assumptions: realism and idealism. Realism holds that nature determines reality, independent of human perception or consciousness. Idealism, however, suggests that truth is subjective and varies based on an individual's perspective.

To properly analyse the impact of fintech on financial services and the factors that influence fintech adoption, the researcher had to adopt a subjectivist perspective. This is because the participants' different interpretations and perceptions are crucial in understanding the phenomena under study. The impact of fintech and factors influencing adoption can be interpreted differently by each participant, so the researcher used themes found in their statements to support their perspectives.

Epistemology: Epistemology explores the relationship between the researcher and reality and how knowledge can be acquired (Sobh and Perry, 2006). It also considers the relationship between the researcher and research participants (Ponterotto, 2005). There are two types of epistemologies: objectivist and subjectivist. Objectivist epistemology assumes that the discovered reality is factual, while subjectivist epistemology suggests that reality is created and discovered (Khan, 2014). Madondo (2015) recommends that researchers maintain a distance from their subjects to avoid biases. This study adopted a subjectivist approach to uncover the truth about fintech's impact and factors influencing its adoption.

Axiology: Axiology deals with values and ethics (Saunders, Lewis and Thornhill, 2019), and examines how researchers' values influence the different stages of the research process (Ponterotto, 2005; Ade Bilau, Witt and Lill, 2018). In studying the impact of fintechs on financial services in South Africa and factors influencing adoption, a subjectivist approach was adopted to gain multiple perspectives. By analysing interviewees' perceptions and interpretations, as well as incumbents' and regulators' reactions to the technology, the researcher aimed to understand the subjective realities of different social actors. The researcher's values were a vital part of the study, providing a more meaningful interpretation of the results.

Five research philosophies

There are five (5) distinct types of research philosophies: positivism, critical realism, interpretivism, postmodernism and pragmatism.

Critical Realism: Critical realism is a philosophical approach that seeks to understand reality and meaningful actions (Baxter and Chua, 2019). It adopts a realist ontology and aims to identify the causal process and context that leads to a specific outcome (Armstrong, 2019). It views the world as an open system that exists independently of human knowledge (Avenier and Thomas, 2015).

Postmodernism: The philosophy of postmodernism emphasises that knowledge about the world is not absolute and is shaped by others (Sousa, 2010). Postmodernists do not believe in rigid order and prioritise fluidity and change. They acknowledge that any form of order is temporary and lacks a solid foundation. Furthermore, they recognise that language is incomplete and biased towards certain aspects (Saunders, Lewis and Thornhill, 2009).

Positivism: The philosophy of positivism is adopted by natural scientists, which involves observing social reality and creating law-like generalisations (Armstrong, 2019). This approach is influenced by experimental methods drawn from natural science (Bahari, 2010). The positivist viewpoint assumes that the universe consists of objectively given and unchanging objects and structures that exist as empirical entities regardless of the observer's assessment (Goles and Hirschheim, 2000). The approach involves manipulating theoretical proposals using formal logic rules and the laws of hypothetico-deductive logic (Lee, 1991).

Interpretivism: This philosophy offers an alternative to positivism, taking a relativistic stance that acknowledges the existence of multiple, equally valid realities. This philosophy asserts that reality is not an independent entity but a construct of an individual's mind. To arrive at meaning, interpretivists employ critical thinking, recognising that it is not readily available (Ponterotto, 2005). Bahari (2010) advocates that interpretivists can interpret their societal roles based on their understanding of the meaning and the social roles of others according to their unique meanings.

Pragmatism: This research employed the pragmatism philosophy, a paradigm preferred for mixed methods. This is because pragmatists believe that a holistic picture of the study requires more than one point of view. Considering this, mixed methods are the preferred way to get to the complete picture (Szyjka, 2012). Pragmatism allowed the researcher to harmonise objectivism and subjectivism, facts and values, precise and thorough knowledge, and varied contextual experiences. This was achieved by examining theories, concepts, ideas, hypotheses, and research results not only in abstract terms but also in their application in thought and action and their practical results in particular situations, as advocated by Saunders, Lewis and Thornhill (2009).

3.3. RESEARCH APPROACH

There are three research approaches- deductive, inductive, and abductive (Ade Bilau, Witt and Lill, 2018). In a deductive approach, a researcher starts by developing a theory and hypothesis or (hypotheses) and uses this to design a research strategy to test the hypothesis. In an inductive approach, a researcher collects data first and uses these data to develop a theory. In the last approach, the abductive, a researcher collects data to investigate a phenomenon and analyse it to create a new or modify an existing theory, which they then test using additional data (Saunders, Lewis and Thornhill, 2019).

Inductive: The inductive approach develops theory using data. It is concerned with making sense of data that have been collected and analysed. This is accomplished by identifying themes and patterns for formulating a theory presented as a conceptual framework (Ade Bilau, Witt and Lill, 2018). In this study, the researcher used an inductive approach because there was not enough data to develop a new theory for the topic being studied, and the phenomenon investigated was recent in this research's context (South Africa). The phenomenon of fintechs like digital-only banks is new in South Africa, as the first digital-only bank was launched in the second quarter of 2019. Therefore, the researcher needed to collect the data and then analyse them to create the framework. Researchers' reasoning began with detailed world observations and progressed to more conceptual generalisations and concepts. As he went through his research, the researcher formulated empirical generalisations and outlined exploratory correlations. The researcher began with no knowledge of the type or nature of the research findings and continued to do so until the study was completed.

In this study, the researcher started collecting data relevant to the task. When enough data had been collected, the researcher then reviewed the data and searched for common themes and relationships from the observations that could be used to develop explanations and the development of theories that could explain those patterns. The researcher used a bottom-up approach to understand and formulate theories. In this, the results were used to describe the phenomena studied.

Before beginning the research, the researcher utilised established theories to formulate questions that would aid in achieving the research objectives. This approach facilitated a strong connection between the social reality of the research participants and the emerging theory.

3.4. RESEARCH DESIGN

The research design is the plan for answering the research question(s) (Greener, 2008). It includes research objectives, details on where data will be collected, how data will be analysed, and ethical issues related to the research (Saunders, Lewis and Thornhill, 2019). Research designs are classified into quantitative, qualitative, and mixed methods, as shown in Table 3-2.

Table 3-2 Research Approaches

Quantitative	**Qualitative**	**Mixed methods**
Philosophy: Positivism	**Philosophy:** Interpretivism	**Philosophy:** Pragmatism and critical realism
Approach to theory development: Usually associated with a deductive approach. However, it may also incorporate an inductive approach.	**Approach to theory development:** May commence with an inductive or a deductive approach to test an existing theory using qualitative procedures. In practice, it uses an abductive approach to theory development where inductive inferences are developed, and deductive ones are tested iteratively throughout the research.	**Approach to theory development:** May use deductive, inductive, or abductive approaches, e.g., quantitative research may test a theoretical proposition(s) and further qualitative research (or vice versa) to develop a richer theoretical understanding. Theory may also be used to provide direction for the study.
Research strategy: Experimental and survey.	**Research strategy**: Action research, case study, ethnography, grounded theory, and narrative inquiry.	**Research strategy:** Concurrent triangulation, concurrent embedded, sequential exploratory, and sequential explanatory.
Techniques: Structured observations, questionnaires, and structured interviews.	**Techniques:** Observations, semi-structured and in-depth interviews.	**Techniques:** Structured observations, questionnaires, in-depth interviews, structured interviews.
Characteristics: • The researcher is seen as independent from those being researched. • Designed to examine relationships between variables. • Often uses probability sampling to ensure generalisability. • Collection results in numerical and standardised data. • Analysis conducted using statistics and diagrams.	**Characteristics:** • The researcher is not independent of those researched. • Designed to study participants' attributed meanings and associated relationships. • It uses non-probability sampling. • Based on meanings expressed through words and images. • Collection results in non-standardised data, requiring classification into categories.	**Characteristics:** • Draws from the characteristics of both quantitative and qualitative research.

Mixed methods research designs: Mixed method research combines qualitative and quantitative data collection techniques and analytical procedures within a single study. The researcher utilises elements from both qualitative and quantitative research (Saunders, Lewis and Thornhill, 2019). This provides an in-depth analysis of the phenomenon via triangulation, in which various data collection methods and analysis are used to enrich and confirm the research findings (Greener, 2008). Greener (2008) adds that in mixed methods research, survey results are commonly used to explore the general view of the research question, while interviews are used to delve deeper into the phenomenon. To thoroughly analyse a phenomenon, triangulation is employed. This involves using multiple data collection methods and analyses to enhance and validate research findings, as Greener (2008) noted. This author also explains that surveys are often used in mixed methods research to gain a broader perspective on the research question, while interviews are utilised to delve deeper into the phenomenon.

The core focus of this research was to analyse the impact of fintechs in the financial services industry, to examine the response strategies used by the incumbents to ensure that they remain competitive, to study how regulators respond to the regulatory challenges brought by fintech, to evaluate the impact of the COVID-19 pandemic in fintech adoption, and to investigate the factors that influence consumers to adopt fintechs in South Africa. The literature review revealed that the advent of fintechs has left academics and many stakeholders in the financial services industry with many questions that need to be answered. Some feel these technologies will bring challenges like those online retailers like Amazon and the likes brought to the retail industry. Furthermore, the regulators need to figure out how to regulate fintechs and have been found wanting because some of the current regulations need to be revised to regulate these innovations. Consequently, the incumbents and regulators seek ways to respond to these disruptions. Lastly, because the adoption of fintechs is relatively low in developing countries, such as South Africa, business leaders need to know the factors influencing consumers to adopt fintechs. Due to these questions' complexity, interviews were used to answer them and achieve the research objectives. The interviews helped explore several dimensions of the financial services industry, including the research participants' everyday life, views, and experiences, as Mason (2002) asserted.

In studying these phenomena, the researcher embedded himself inside the traditional financial institutions (banks), fintechs and regulators to comprehend their (banks,' fintechs', regulators', and customers') reality and the research phenomena using the perspective of regulatory experts, incumbent banks' experts, fintechs experts, and customers who are involved in the day-to-day activities. This enabled the researcher to investigate the challenges and benefits that fintechs bring to the financial services industry, study the strategies used to respond to the fintechs, uncover the factors important for adoption and determine the impact of COVID-19 in fintechs adoption. The research was done 'from inside out' and provided a detailed analysis of the impact of fintechs and factors influencing consumers to use fintechs. This helped the researcher to gather data and meaning organically from the research context and the variables studied in their natural setting in which they are found, as contended by Astalin (2013). Kothari (2004) asserts that this enables the researcher to assess participants' attitudes, opinions, and behaviours accurately.

The researcher utilised questionnaires to gain a thorough understanding of the study's subject matter and enhance the qualitative findings. The data collected through the questionnaire served as a supplementary component to the overall design in accordance with the recommendations of Creswell and Plano Clark (2007). The questionnaires were used because of their ability to provide numerical measurements and statistical analysis of measurements to examine these phenomena. The questionnaires helped to study the relationships between the research constructs.

The mixed-method research design was chosen based on insights from several previous studies:

- Research by Thwaits (2016) which investigated the relationships between South African fintech startups and their corporate partners and informal relationships within their respective ecosystems in the financial services industry,
- A study to analyse the impact of technology in the financial services industry by Gibson (2015),
- Ajibade (2019), when studying the limitations of the technology acceptance models,

- Kammerlander, König and Richards (2018), in a study to investigate incumbents' strategies to respond to disruptive innovations,
- A study to investigate factors that make people use mobile payments and their impacts (Karsen, Chandra and Juwitasary, 2019),
- Pramanik, Kirtania and Pani (2019) used mixed methods when studying the demand for digital evolution.

Studies investigating the acceptance of technology by consumers that were done by Venkatesh et al. (2003), Williams, Rana and Dwivedi (2015), Chao (2019) and Gunawan, Sinaga and WP (2019) used surveys. Other studies that investigated different constructs that play a significant role in influencing people to adopt financial technologies also used surveys using questionnaires to gather the data. These studies include studies investigating constructs such as social influence, perceived financial cost, performance expectancy, perceived credibility (Yu, 2012), mass media and interpersonal influence (Suoranta and Mattila, 2004), consumer awareness (Laforet and Li, 2005), trust (Koufaris and Hampton-Sosa, 2004; Wu and Wang, 2005; Shin, 2009), perceived advantages, the opportunity to try out fintechs, perceived risk (Brown et al., 2003; Lee et al., 2003), credibility (Tang et al., 2004; Amin et al., 2008), convenience (Kim et al., 2015; Basri, 2018), perceived security (Shin, 2009), cultural values (Im, Hong and Kang, 2011; Sharma, Singh and Sharma, 2020), task technology fit (Zhou, Lu and Wang, 2010), initial trust and facilitating condition (Afshan and Sharif, 2016; Queiroz and Fosso Wamba, 2019). The study to investigate the role of fintechs in financial inclusion by Baber (2019) also used a survey.

3.5. PURPOSE OF THE RESEARCH DESIGN

The purpose of research determines various aspects such as the type, approach, design, participants, research instruments, procedure, ethical considerations, and method of data analysis (Strydom, 2013). There are various research purposes, including descriptive, explanatory, exploratory, and evaluative, and some combine more than one (Saunders, Lewis and Thornhill, 2019).

Descriptive studies: Descriptive research seeks to provide a detailed account of situations, events, or individuals (Rahi, 2017; Saunders, Lewis and Thornhill, 2019). This type of research can either be an addition or a precursor when the researcher is exploring a phenomenon that is not primarily focused on effects (Strydom, 2013) or conducting exploratory research (Saunders, Lewis and Thornhill, 2019). Descriptive studies can offer more qualitative data through narrative interviews, focus groups, and participant observation to provide in-depth descriptions of phenomena. As reported by Rahi (2017), descriptive studies aim to examine and document an occurrence that cannot be quantified.

Explanatory studies: Explanatory research uses causality to describe a situation or problem (Rahi, 2017) The goal is to investigate a case or problem to describe the interrelationships (Saunders, Lewis and Thornhill, 2019). This study adds new insights into a scenario to develop, elaborate, extend, or test a theory (Rahi, 2017). Strydom (2013) concurs and adds that explanatory studies seek to identify and determine consequences on social phenomenon behaviour and predict the correlation between variables. This results in explaining why events occur and the creation, elaboration, extension, testing, or revision of a theory. Explanatory studies are commonly used in quantitative research (Rahi, 2017).

Exploratory studies: When investigating a new problem or phenomenon lacking sufficient information, exploratory research can help gain initial insights (Strydom, 2013) and formulate further investigative questions (Strydom, 2013; Rahi, 2017). This method is valuable for obtaining open-ended answers and better understanding issues. Exploratory studies can be conducted through various methods such as literature searches, in-depth interviews, and focus group interviews. The questions asked in this type of study contribute to a better understanding of the subject matter interviews (Strydom, 2013; Saunders, Lewis and Thornhill, 2019).

Evaluative studies: In real-world settings, evaluative research assesses the effectiveness of interventions or practices by studying how they work (Bryman, 2012). This type of research is commonly used in business to investigate the success of strategies, policies, programs, initiatives, or processes. Researchers can compare different events or phenomena to determine

their effectiveness and understand why they work. This study can contribute to existing theories by providing a theoretical explanation of the phenomenon's effectiveness (Saunders, Lewis and Thornhill, 2019). Evaluative research may involve elements of exploratory, descriptive, and explanatory research (Strydom, 2013).

Combined studies: The method of combined studies involve using multiple research techniques to achieve multiple goals, such as exploratory, descriptive, explanatory, or evaluative research (Saunders, Lewis and Thornhill, 2019).

This research utilised both exploratory and evaluative purposes. The exploratory purpose was used because the study dealt with a new phenomenon and required addressing emerging concerns. The researcher needed to investigate new ground by addressing emerging problems that had little information available (such as the impact of fintechs on the financial services industry in South Africa, response strategies by incumbents and regulators to the effects of fintechs in South Africa, the impact of the COVID-19 pandemic in financial services and the factors influencing customers to adopt fintechs such as digital-only banks).

The study also used an exploratory approach because it aimed to evaluate the impact of fintechs on the financial services industry and assess whether they present new growth opportunities while exploring the challenges and benefits of financial technologies.

3.6. RESEARCH STRATEGY

The research strategy is a plan that a researcher uses to answer the research question(s) and meet the research objective(s) (Rahi, 2017). It links the research philosophy and the methods chosen to collect and analyse the data (Bryman, 2012). When deciding on a research strategy, the researcher must consider whether the strategy chosen will allow the researcher to answer the research questions and meet the objectives. As a result, the research questions and objectives, the amount of time, the philosophical foundations (Saunders, Lewis and Thornhill, 2019), the research approach, the depth of existing knowledge in the study area, and accessibility to the data source and the availability of resources that the researcher requires to conduct the study all influence the strategy used (Rahi, 2017; Ade Bilau, Witt and Lill, 2018).

Different research strategies may be applied to conduct research. These include experiments, archival and documentary research, survey, systematic reviews, ethnography, grounded theory, narrative research, and case study (Ade Bilau, Witt and Lill, 2018; Saunders, Lewis and Thornhill, 2019), systematic reviews, Delphi method and field experiments (Bryman, 2012; Ade Bilau, Witt and Lill, 2018).

Phenomenology:

When conducting a narrative study, the experiences of one or several individuals are reported. On the other hand, a phenomenological study aims to describe the ordinary meaning of a concept or phenomenon for a group of individuals. Phenomenologists identify the similarities in participants' experiences of a phenomenon (Creswell, 2013). This aligns with Smith's (2013) definition of phenomenology as the study of how people experience things, and the meanings they assign to them. In congruence, Husserl (1970) refers to phenomenology as the science of the essence of consciousness, which examines lived experiences from a first-person perspective. Elkatawneh (2016) views phenomenology as a logical approach to investigating practice because what people see also practice.

In this research, the phenomenology research strategy was used because it enabled the researcher to understand the meaning of the experience of the research participants from their perspectives. The researcher wanted to uncover and understand the shared experiences of various participants: incumbent financial institutions' experts, fintechs experts, regulatory experts, and financial services customers. Understanding these shared experiences allowed the researcher to gain a more in-depth understanding of the characteristics of the phenomena being studied and therefore answer the research questions as asserted by Creswell (2013).

The researcher interviewed experts from incumbent banks, fintech organisations, financial services regulators, and financial services customers to conduct this study. Interviews were chosen as the preferred method due to their ability to provide valuable insights into the participants' perspectives on the phenomena under investigation, as explained by Kothari (2004). The researcher conducted semi-structured interviews online to adhere to COVID-19

social distancing guidelines. This method is preferred when face-to-face interviews are not possible, as explained by Saunders, Lewis and Thornhill (2019). The electronic interviews allowed for the automatic recording of the conversation, which eliminated any difficulties related to audio recording.

Survey: Questionnaires were utilised to supplement and confirm the findings from interviews. This aided in triangulation and the development of a fintech adoption framework. The questionnaires enabled the collection of primary data from the population samples. Standardised data were gathered from respondents using questionnaires, which were then quantitatively analysed using descriptive and inferential statistics.

3.7. CHOICES

The researcher employed various data collection techniques and analysis procedures to address the research questions. Data were gathered through interviews and questionnaires. This method is commonly utilised in business and management research (Saunders, Lewis and Thornhill, 2009).

3.8. TIME HORIZON

When conducting research, the time horizon is the duration of the study. There are two types: cross-sectional and longitudinal. A cross-sectional study is a brief study that collects data at a particular moment, while a longitudinal study collects data over an extended period to compare results (Saunders, Lewis and Thornhill, 2019).

To account for time limitations, the researcher opted for a cross-sectional study to explore the subject matter, which provided a “snapshot” of the impact of fintechs in the financial services industry. Data collection was conducted from December 2021 to May 2022.

3.9. TECHNIQUES AND PROCEDURES

Sampling techniques enable the researcher to narrow the data collected to data from a sub-group rather than all cases (Saunders, Lewis and Thornhill, 2009). Sampling techniques of this study are discussed below.

3.9.1. Target population

It was critical that the researcher carefully selected the population sample to ensure that the participants targeted provided a diverse range of opinions and a thorough understanding of financial technologies in the South African financial services industry. Therefore, the target population was made up of four groups:

- Incumbent financial institutions experts (executives and managers).
- Regulatory institutions experts (executives and managers).
- Fintech companies' experts (executives and managers).
- Financial services customers.

3.9.2. Sampling

For this study's research questions and objectives, the researcher could not collect data from every individual in the target population because of restrictions on time, money, and access. Therefore, the researcher only collected data from sub-groups rather than all cases. In sampling, a fractional part of the entire population was selected, as advocated by Saunders, Lewis and Thornhill (2019). The researcher chose specific groups within a population to focus his research on and used their findings to represent the entire population. Two sampling techniques, as discussed by Cooper and Schindler (2014) and Saunders, Lewis and Thornhill (2019), were used in this process:

Non-probability sampling or judgmental sampling. The chances of selecting everyone are unequal in this technique, and the probability of choosing each case from the total population cannot be quantified. This technique is used when random probability sampling cannot be done due to time or cost considerations.

The Banking Association South Africa has thirty-two (32) member banks and given the size and scope of South Africa's financial services; the researcher could only interview individuals from some financial institutions. Therefore, suitable selective samples of individuals from a selected group of incumbent financial institutions, fintech organisations and regulatory institutions were selected using purposive non-probability sampling. This technique allowed the researcher to use his judgement to choose the cases that enabled the researcher to answer the research questions and meet the research objectives, as argued by Saunders, Lewis and Thornhill (2019). The purposive non-probability sampling method was chosen because the participants were identified according to a predetermined criterion relevant to the research questions. Incumbents' experts were drawn from the population of thirty-two (32) banks that are members of the Banking Association of South Africa (PDF.com, 2021; The Banker, 2021), and the fintech experts were chosen from a population of fintechs that are likely to disrupt the South African financial services industry significantly, i.e., digital-only banks, mobile payment and lending platforms according to Price Waterhouse Coopers (2016). The regulatory experts came from the organisations that are members of the Intergovernmental Fintech Working Group (IFWG). The member organisations are Financial Intelligence Centre (FIC), Financial Sector Conduct Authority (FSCA), National Treasury, National Credit Regulator (NCR), South African Revenue Service (SARS) and South African Reserve Bank (SARB). Eighteen (18) industry experts and seventeen (17) customers were interviewed for this study. This gave a total of thirty-five (35) interviewees.

This sample size is supported by multiple sources who deemed the sample size of thirty-five interviews sufficient. Pursuant to Sandelowski (1995), qualitative samples should be a manageable size but large enough to develop new and rich insights into the phenomenon studied and small enough to allow for deep analysis of the data collected. Morse (2000) posits that researchers must consider constraints such as the study's scope, the topic's complexity, the accessibility of data, data quality and study design when determining the sample size. She argues that the more valuable data collected from each person, the fewer participants are required. Bowen (2008) concurs and argues that an appropriate sample comprises knowledgeable participants. Britten (1995) adds that studies using individual interviews should have at most 50 interviews, while Creswell (2013) and Saunders, Lewis and Thornhill (2019) suggest that a researcher should interview about 20 to 30 respondents. Vasileiou et al. (2018) contend that greater rigour is needed in determining sample size in qualitative research. They

suggest that the optimal sample size should range from 20 to 30 interviews for grounded theory and 15 to 30 interviews for single case studies. Creswell (2013) recommends 5 to 25 individuals who have all experienced the phenomenon for phenomenology studies.

The theory further suggests that the sample size is only necessary for determining the extent to which saturation issues have been carefully considered (Bowen, 2008). Hagaman and Wutich (2017) assert that a minimum of 20 interviews are required to achieve saturation in some studies, while Francis et al. (2010) proved that saturation could be achieved with less than twenty interviews when they reached theirs at the 17th interview in their research. These researchers went on to propose two main principles upon which saturation should be based:

(a) Researchers should choose an initial sample for analysis ahead of time (e.g., ten interviews), which will be used for the first round of analysis and

(b) A stopping criterion, i.e., a certain number of interviews (e.g., three) that must be conducted further, but the analysis of which will not yield any new themes or ideas.

Sample saturation for the industry experts was reached after eighteen interviews and seventeen for customer interviews. These were the points of redundancy whereby the researcher had gathered data to the point of diminishing returns in which conducting more interviews could provide nothing new, as argued by Bowen (2008). By this point, the researcher had heard it all, and any further data collection could have been meaningless, provided no new themes and no novel issues regarding the data category. This was consistent with Marshall, Bryan, Cardon, Peter, Poddar, Amit, Frontenot, Renee (2013) and Fusch and Ness (2015) assertions that the researcher should stop collecting data once he has reached data saturation. At this point, the researcher should be confident that sufficient information is available to reproduce the study when further coding is no longer feasible.

Probability sampling or representative sampling. This technique uses random selection, and the probability of selecting every case from the population is known and usually equal. The probability sampling method enables the researcher to answer research questions and fulfil research objectives using quantitative analysis.

Probability sampling was used to conduct the questionnaire data collection. The researcher went to the malls and other public places and randomly selected individuals to participate in the study. Four hundred individuals (banked individuals) agreed to participate in the survey, and questionnaires were sent to them via email and WhatsApp. One hundred and twenty consumers completed the questionnaires, but one was excluded from the analysis as it was incomplete. The size of this sample was considered sufficient as supported by several authors.

Adwok (2015) argue that population size becomes almost irrelevant beyond a population size of 5,000 or more. Tinsley and Tinsley (1987) and Wolf et al. (2013) suggest that a sample size of at least 100 to 150 is sufficient. Researchers say larger sample sizes have less variability and are more expensive (Adwok, 2015). Greener (2008) cautions that while it is best to have a large sample size, the selected sample must represent the characteristics of the population, and the acceptable sample size should only be large enough to allow for the eventual production of statistically enough numbers in each subcategory or sub-sample. As a result, it is necessary to determine the optimal sample size that will account for variability while remaining sensitive to detect statistical significance (Adwok, 2015).

The units of analysis for this study were the financial services industry (regulatory, incumbents, fintechs) executives, managers, and customers. The unit of analysis refers to the entity being studied in the research, i.e., the item about which the researcher wishes to say something at the end of the study (Dolma, 2009). It could be the person or object from which the researcher collects data. It includes individuals, groups of individuals, organisations of individuals, countries, technologies, and entities that are the focus of the investigation. A unit of analysis responds to what and who is being studied in research (Kumar, 2018). Determining or being aware of the research unit of analysis is critical in any research endeavour (Dolma, 2009).

3.9.3. Research instruments

To ensure accurate answers to research questions and objectives, primary data were gathered using two main techniques: interviews and questionnaires. These methods allowed the researcher to ask participants and respondents targeted questions, facilitating the achievement of research goals. Semi-structured interviews were chosen for their flexibility, allowing for additional ideas to emerge during discussions with interviewees. Open-ended questions also

encouraged dialogue rather than a simple Q&A format. The interviews were conducted electronically via online platforms to adhere to COVID-19 safety measures. To design the questionnaires, validated scales from other technology adoption studies were adopted (Table 4-3), and each construct included at least three questions.

3.9.4. Pilot study

A pilot study was conducted with ten respondents for the questionnaire and ten participants for the interviews. The feedback obtained from the pilot study was used to enhance and refine the final questionnaire and interview questions. Saunders, Lewis and Thornhill (2019) advise that researchers must conduct a quality check by testing their research instruments on a small sample before collecting data. This step ensures that the questions are clear, participants and respondents can answer them, and the researcher can collect data without any issues. Additionally, this process helps the researcher assess the data's validity and reliability. The pilot study results can highlight any weaknesses in the questions and provide recommendations for improvements (van Teijlingen and Hundley, 2002).

3.10. DATA ANALYSIS

3.10.1. Qualitative data

Qualitative data refers to non-numerical or non-quantified data, including questionnaire responses, in-depth interview transcripts, and policy documents. These data require analysis and interpretation to convey the meaning within the study's framework (Saunders, Lewis and Thornhill, 2019). Primary data were collected through interviews and questionnaires to answer the research questions and achieve the objectives. The interviews were recorded and transcribed for further analysis of the data.

To effectively group and organise qualitative data into similar themes and ideas, the researcher utilised Atlas.ti 22, a Computer Assisted Qualitative Data Analysis Software (CAQDAS). This approach is recommended by prominent researchers such as Ibrahim (2012) and Alhojailan (2012), who advocate using software to increase the analysis's rigour. Additionally, Atlas.ti is

versatile, and according to Friese, Susan, and Soratto (2018), it can be used with a variety of theoretical approaches and data analysis methods, including thematic analysis - a widely used data analysis method in qualitative research as noted by Braun and Clarke (2006).

The researcher utilised thematic analysis to analyse the data collected through interviews. This is considered the most effective method for studies seeking to infer insights (Nowell et al., 2017). This approach provides a comprehensive and detailed depiction of the data and is highly adaptable, making it suitable for various research needs (Braun and Clarke, 2006). This study employed thematic analysis to systematically analyse the data and connect the frequency of each theme with the content that enhances the overall meaning of the research. One of the benefits of this method is that it allows for a more comprehensive understanding of potential issues (Alhojailan, 2012; Vaismoradi, Turunen and Bondas, 2013). The thematic analysis helped examine industry experts' perspectives, highlighting commonalities and differences and generating insights. Additionally, this method allowed the researcher to summarise the key features of the data set, as described by Braun and Clarke (2006).

As stated in Braun and Clarke (2012) methodology, the process of conducting a thematic analysis involves six steps: becoming familiar with the data, generating codes, searching for themes, revising themes, defining themes, and producing a report.

- In the initial step, the researcher spent a considerable amount of time engaging with the collected data, documenting his thoughts on potential codes and themes, and organising the raw data in a systematic manner. He also maintained records of all data field notes, transcripts, and reflexive journals.
- The second step involved generating initial codes to label the topics discussed by the participants.
- Next, the researcher created an Atlas.ti project to gain an overall understanding of the data and search for themes.
- The fourth step involved reviewing the themes and ensuring that the coded data extracts for each theme formed a coherent pattern. The validity of each theme was also considered to ensure that it accurately reflected the meanings in the data set.

- In the fifth phase, the researcher defined and named the themes, conducting a detailed analysis of each one and identifying what aspect of the data it captured. The researcher also analysed how each theme fit into the overall account of the research questions.
- Lastly, the research findings were written.

3.10.2. Quantitative data

Saunders, Lewis, and Thornhill (2019) define quantitative data as information that can be expressed numerically. Such data can be further categorised into two types: categorical and quantifiable. Categorical data pertains to traits such as gender, race, and religion, which cannot be quantified. Conversely, quantifiable data refer to information that can be measured numerically, such as age, weight, and height.

In this study, the researcher collected categorical and quantifiable data through questionnaires. Categorical data helped the researcher gather demographic information, while quantifiable data allowed the researcher to analyse the research phenomena. The researcher used SPSS 28 and Amos 27 software to analyse the data. He used inferential statistics to draw generalisations from the sample group, which helped him describe the data and draw conclusions about the populations from which the samples were taken as asserted by Marshall and Jonker (2011). The researcher also used descriptive statistics to explain the characteristics of the groups of observations. Descriptive statistics enabled the researcher to summarise the data set and represent the entire population sample as advocated by Ambrosius (2007).

To test hypotheses and explore relationships between variables, the researcher utilised the Structural Equation Modeling **(**SEM) method. Through structural equation modeling, they were able to analyse the paths in the model and draw conclusions. The researcher used Amos 27 to perform a path analysis and test model hypotheses.

Chi-square to degrees of freedom ratio ($\chi 2$/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) were used to evaluate

the goodness of fit of a model in SEM. In accord with Shi, Lee, and Maydeu-Olivares (2019), a CFI between 0.611 and 0.972 is deemed acceptable, while an RMSEA of 0.06 or lower is also considered a satisfactory (Hu and Bentler, 1999).

3.11. VALIDITY AND RELIABILITY

To ensure scientific accountability, researchers must use measures such as validity and reliability tests. In accord with Krishnaswamy, Sivakumar and Mathirajan (2006) and Saunders, Lewis and Thornhill (2019), validity determines whether the results accurately represent the population being studied. In qualitative research, validity refers to the appropriateness of the tools and processes used (Leung, 2015). Validity also assesses whether the research question, methodology, sampling, and data analysis are suitable for the desired results and whether the conclusions are valid for the sample and context (Leung, 2015; Saunders, Lewis and Thornhill, 2019).

In qualitative research, reliability pertains to the consistency and repeatability of results (Greener, 2008), which is crucial for determining causality between two variables, ensuring accuracy in data collection and analysis, and minimising experimental errors (Leung, 2015). Despite qualitative data's inherent subjectivity and narrative nature, the methodology employed should produce ontologically similar data to allow for a margin of variability in results (Zohrabi, 2013). Rather than expecting identical outcomes, the aim should be to ensure that the findings are consistent and dependable based on the data collection process (Lincoln and Guba, 1985).

To ensure the validity of the qualitative data collected, the researcher aimed to establish five critical aspects of trustworthiness: credibility, dependability, conformability, transferability, and authenticity.

Credibility: The researcher employed environmental triangulation by conducting interviews with participants at various times of the day (morning, midday, and afternoon) and in various settings, such as private residences and public workplaces.

Dependability: The researcher employed an external audit known as the dependability or inquiry audit to demonstrate the extent to which the credibility and transferability standards were adhered to in the implementation of techniques.

Conformability: The researcher meticulously documented the data collection process, analysis, and interpretation using an audit trail. Notably, the researcher also noted intriguing topics during data collection, provided insights on coding, and expounded on the significance of the emerging themes.

Transferability: The researcher created a thorough and comprehensive report detailing their experiences during the data collection process.

Authenticity: The researcher followed the testing methods recommended by Amin et al. (2020)**.** The participants were informed that their participation was voluntary and that their consent was necessary for the interviews to proceed. Additionally, the researcher established a positive relationship with the participants to encourage their free participation.

The following classes of reliability estimates were used to ensure the reliability of the questionnaires:

- **Test-retest reliability:** The questionnaires were administered to the research subjects at different times.
- **Inter-rater or inter-observer reliability**: The researcher measured the agreement between different individuals for a phenomenon.

The validity of the data for the questionnaires was tested through the following points:

- **Face validity**: The researcher used the pilot study to ensure that the questionnaires for this research were relevant to the study.
- **Content validity**: The researcher used the pilot study to measure the extent to which the research questions answer the research questions.
- To ensure **measurement validity**, the study questionnaires were developed based on established literature and conceptualisation. The researcher utilised existing validated scales from TAM and UTAUT models in designing the questionnaire used to determine the factors that influence consumers to adopt fintechs in South Africa.
- **Internal consistency** was measured with Cronbach's alpha.

- **External validity** is concerned with whether the results of a study can be generalised to other settings (Polit and Beck, C, 2010). Random sampling was used to achieve this.
- **Discriminant validity**: When conducting research on latent variables, it is crucial to evaluate discriminant validity to avoid issues with multicollinearity. While the traditional method for this purpose is the Fornell and Larcker criterion, another approach, known as the heterotrait-monotrait (HTMT) ratio of correlations method, can be used for assessing discriminant validity (Ab Hamid, Sami and Mohmad Sidek, 2017). In this research, the Fornell and Larcker criterion was used. This method evaluates discriminant validity by comparing the square root of each AVE in the diagonal with the correlation (off-diagonal) of each construct (Fornell and Larcker, 1981).
- **Convergent validity** was used to assess whether items in the different scales measure common underlying construct. To demonstrate convergent validity, items measuring the same trait must highly correlate (Davis, 1989). To meet the criteria for convergent validity, all items should load at more than 0.5, and the average variance extracted (AVE) of the constructs should exceed 0.5 (Ab Hamid, Sami and Mohmad Sidek, 2017).

3.11.1. ELIMINATION OF BIAS

To eliminate bias, the research questions and questionnaires were written in English. Interviews were also conducted in English, which is widely recognised as the language of business. However, in some instances where English proved to be a barrier, the interviewees' language was utilised to explain the subject matter. Furthermore, efforts were made to avoid jargon to ensure clarity and prevent wrong interpretations of the questions. The researcher also avoided the use of language that reinforces stereotypes. Random sampling was also used to reduce bias in the quantitative study. To eliminate common method bias, interviews were conducted to corroborate quantitative findings, and data were collected at various times of the day.

3.11.2. ETHICAL CONSIDERATIONS

Ethics constitute an essential component of the research (Tracy, 2010). “Research ethics relates to questions about how a researcher formulate and clarify the research topic, design the study and gain access, collect data, process and store the data, analyse the data and write up the research findings morally and responsibly” (Saunders, Lewis and Thornhill, 2009:184). The researcher ensured that he designed his research methodologically sound and morally defensible. Further, before the researcher commenced data collection for this study, he obtained ethical clearance from the scientific review committee and ethics committee of the University of South Africa (UNISA) (ethics clearance reference number: 2021_SBL_DBL_016_FA, Appendix G).

In the manner of Miles and Huberman, Michael (1994), researchers need to consider the potential harm that may arise from their research. To ensure this, researchers should adhere to the principle of doing no harm and not just focus on the research results. To follow this guideline, all participants were informed about the purpose of the study and any potential issues that may arise. Additionally, participants were informed of their right to participate or withdraw at any point. To participate in the study, participants had to sign a consent form (Appendix A) or accept the consent for electronic questionnaires before answering research questions. This ensured that informed consent from research subjects was obtained before data collection commenced.

In research, confidentiality and anonymity are vital to safeguarding the privacy of participants and respondents. Confidentiality involves modifying personal identifiers on collected data, while anonymity involves excluding personal identifying information altogether (Tracy, 2010; Miles, Huberman and Saldana, 2014). To protect his subjects’ identities, the researcher implemented the following measures to maintain confidentiality and anonymity:

- The data were kept in a password-protected computer and accessed by the researcher only.
- Efforts were made to exclude personal identifying information during data collection.
- In cases where data collected had personal identifying information, this information was removed during coding and thematic analysis so that it did not appear in the final report.

Lastly, to mitigate the risks of contracting COVID-19 during data collection, the researcher ensured that all participants and the researcher observed and adhered to the safety precautions recommended by the World Health Organisation and the South African Department of Health to prevent infection. These included maintaining a social distance of at least 2 metres and wearing personal protective equipment (PPE) such as masks during face-to-face engagements. Moreover, all interviews were conducted via Microsoft Teams.

3.12. CONCLUSION

This chapter outlined the methodology used to conduct this study. It discussed the research philosophy, approach, design purpose, research strategy, techniques and procedures used to collect the data, and the methods used to analyse research data. The study employed pragmatism philosophy, an inductive approach, and mixed methods. Atlas.ti 22 was used to analyse interview data, and SPSS 28 and Amos 27 were used to analyse questionnaire data.

CHAPTER 4: FINDINGS

FOCUS AREA 1 FINDINGS: THE IMPACT OF FINTECHS ON THE FINANCIAL SERVICES INDUSTRY IN SOUTH AFRICA

4.1. INTRODUCTION

The primary goal of conducting research is to answer the research questions. A reliable research methodology that outlines the procedures, methods, and strategies to be employed must be used to achieve this. The research methodology employed in this study was discussed in the preceding chapter.

In this chapter, the research findings, which are divided into two focus areas, will be presented. The first focus area presents the results concerning the impact of fintechs on the financial services industry in South Africa, while the second focus area presents the findings on the adoption of fintechs in South Africa.

Focus area one was used to answer the following research questions:

- What is the impact of fintechs on the financial services industry in South Africa?
- How do traditional financial institutions and regulators respond to fintech disruptions in South Africa?
- Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

Thematic analysis was used to analyse the qualitative data from the interviews, and SPSS 28 was used to analyse quantitative data from the questionnaires. The dominant themes that emerged from thematic analysis are discussed in detail below.

4.2. DEMOGRAPHICS OF THE PARTICIPANTS

In this study, eighteen industry experts were interviewed, all of whom were executives, including CEOs of various financial institutions such as incumbent banks, fintech companies, and regulators. Three of these executives were female. Among the experts, four work for financial services regulators, eight work for incumbent banks, and five work for fintech companies. Collectively, these experts have a total financial services experience of 274 years. Table 4-1 below presents the demographics of the industry experts.

Table 4-1 Demographics of the industry experts

Respondent	**Code**	**Gender**	**Position**	**Type of institution**	**Financial services industry experience at the time of the interview**
Regulatory Expert 1	RE1	Male	Executive	Regulatory	10
Regulatory Expert 2	RE2	Male	Executive	Regulatory	3
Regulatory Expert 3	RE3	Male	Executive	Regulatory	14
Regulatory Expert 4	RE4	Female	Executive	Incumbent Bank	19
Incumbent Expert 1	IE1	Male	Executive	Incumbent Bank	12
Incumbent Expert 2	IE2	Male	Executive	Incumbent Bank	13
Incumbent Expert 3	IE3	Male	Executive	Incumbent Bank	35
Incumbent Expert 4	IE4	Female	Executive	Incumbent Bank	11
Incumbent Expert 5	IE5	Male	Executive	Incumbent Bank	5
Incumbent Expert 6	IE6	Male	Executive	Incumbent Bank	9
Incumbent Expert 7	IE7	Female	Executive	Incumbent Bank	11
Incumbent Expert 8	IE8	Male	Executive	Incumbent Bank	25
Fintech Expert 1	FE1	Male	Executive	Fintech	7
Fintech Expert 2	FE2	Male	Executive	Fintech	10
Fintech Expert 3	FE3	Male	Executive	Fintech	35
Fintech Expert 4	FE4	Male	Executive	Fintech	17
Fintech Expert 5	FE5	Male	Executive	Fintech	3
Fintech Expert 6	FE6	Male	Executive	Fintech	35
Total years of experience					**274**

4.3. QUALITATIVE FINDINGS

Eighteen experts from the financial services industry were interviewed for their vast knowledge, experience, and roles in the field. Their insights helped the researcher to gain a comprehensive understanding of the industry's current state and future direction. By contextualising the data and insights, the researcher could answer the research questions more effectively. The findings were categorised into six themes and sub-themes that aligned with the research objectives and questions (Table 4-2).

Table 4-2 Themes of the data collected from the industry experts' interviews

Themes	**Sub-themes**	**Research questions**
Impact of fintechs	Incumbents' challenges presented by fintech	What is the impact of fintechs on the financial services industry in South Africa?
	Regulatory challenges presented by fintech	
	Benefits presented by the fintech	
Responses to fintechs	Responses by the incumbents	How do traditional financial services institutions and regulators respond to fintech disruptions in South Africa?
	Responses by the regulators	
Effects of the COVID 19 pandemic		Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

4.3.1. Theme 1: Impact of fintechs

Fintechs have impacted the entire value chain and all stakeholders, including financial institutions, regulators, and customers, and have challenged the financial services industry's fundamentals (Daniel, 1999; Brown et al., 2004; Gomber, Koch and Siering, 2017; World Economic Forum and Accenture, 2017).

This theme corresponds to the research question: "What is the impact of fintechs on the financial services industry in South Africa?" The primary objective of this research question was to gather industry perspectives on the impact of fintechs on the financial services industry in South Africa. This theme was further subdivided into three sub-themes:

- Incumbents' challenges presented by fintechs.
- Regulatory challenges presented by fintechs.
- Benefits presented by the fintechs.

To explore the impact of fintech on the financial services industry, individuals were interviewed to gather their perspectives. The results indicated that fintechs have both positive and negative impacts on the industry, affecting various players such as incumbents, regulators, and customers in different ways. The negative impact was categorised as challenges presented by fintechs, while the positive impact as benefits presented by fintechs. The challenges are discussed in terms of the impact on incumbent financial institutions, and financial regulations, while the benefits highlight how fintech can positively impact the industry and benefit customers.

Theme 1A: Incumbents' challenges presented by fintechs

The emergence of fintechs has brought several new challenges to the financial services industry and the business models of incumbents (Yanagawa, 2018).

In accordance with the study findings, financial technologies have introduced the following challenges for the incumbents:

- Increasing competition and reducing profits.

- Exposing the inability of the incumbents to be agile and act fast, and that incumbents are more risk averse.

Increasing competition and reducing profits and reducing profits

Incumbent expert 7 (IE7) argued that "*Fintech presents new challenges for the incumbents"* by "*increasing the amount of competition within the market or the financial services space"*, fintech expert 5 (FE5) added. In support, IE1 argued: that "*fintechs started encroaching into financial services*" and "*have reduced the share of profit pools that financial services enjoy for the same services, and, they have also reduced the price and expectations of customers in terms of how much should be paid for certain services".* EI7 concurred and asserted that "*they're definitely eating away or consuming traditional revenue pools".* Consequently, IE6 agreed and said, *"some banks have hardly maintained their market share".* This agrees with the observations of Camarate and Brinckmann (2019), who posited that fintechs have a negative impact on the profitability of traditional banks and the entire financial services sector in South Africa, which has historically been profitable.

The experts argued that the business models of fintechs impact industry profits, causing incumbents to offer certain financial products to consumers with minimal or no fees. To this end, IE1 argued that "*fintechs can go and say no fee, which puts pressure on banks to reduce the banking fees. In some cases that we have seen in other countries, they have eliminated banking fees".* This causes problems for the incumbents. RE2 argued: *"the incumbents are struggling because fintechs can offer products at very low prices.* IE5 agreed and argued that "*fintechs come and then they tell their customers that they can go and withdraw money from any ATM, and they won't charge them a lot of money. They can withdraw money at any bank"* because *"fintechs do not have to invest in having their own ATMs (which are expensive to maintain) around the country"*, argued IE5. Hence, IE5 continued: *"With a cost structure much as low as it is for fintechs, they are coming at a huge advantage, and old banks are at a huge disadvantage to compete properly".* Fintechs can afford to lower the prices *"because their cost for staff compliments and their cost structures are much lower* (IE5)*"*, whilst as reported by regulatory expert 3 (RE3), *"the incumbents are very highly regulated, which raises their cost base".*

Moreover, RE1 argue that *"the incumbent banks still have branch network with all the staff salaries, the buildings to rent and maintain. So, there are kinds of costs associated with that"*, and it can be argued that these costs are preventing the incumbents from reducing their prices significantly. FI4 agreed and made an example of Yocco, the payment fintech, and said: *"if you look at the industry in South Africa and if you look at the likes of Yocco for argument's sake; the traditional banks with card acquiring services with very high terminal rentals couldn't service the market like Yocco services because their devices are too expensive"*. Further if you look at the lending industry, RE2 argued: *"you find that fintechs' repayments are very low compared to your current incumbents because incumbents are still using the old credit scoring methodology which is expensive whereas these guys (fintechs) are taking advantage of the digital data that is the footprint that is freely available"*.

These responses provide sufficient evidence to establish that fintechs hurt incumbent financial institutions by lowering the prices of financial products and services, which hurts incumbent financial institutions by reducing industry profits. This corroborates authors such as Hwang and Christensen (2008), who argue that fintechs primarily affect the financial service industry by introducing technologies that reduce the prices of financial products and services, resulting in increased competition in the industry (Yanagawa, 2018) .

Exposing the inability of the incumbents to be agile and act fast, and that incumbents are more risk averse.

Another challenge that fintechs have exposed, as stated by the experts, is the inability of the incumbents to be agile and move fast because of their legacy systems. IE1 argued: *"it's very difficult to change from one direction with all the legacy traps that we have and then suddenly become this sleek, lean, high-tech machine"*. IE4 agreed and said, "*as you know, we're a bank that's more than 150 years old, and fintech companies come into the industry not having as much legacy as we potentially do, and so their ability to move sometimes is different to ours"*. IE4 further contended that *"one of the key challenges that fintechs bring is a conversation around time to market because they do not have legacy systems. They do not have the scale and size that we have. They can move much faster. You know, a fintech could turn around something in a week that might take us two, three weeks to get done"*. FE6 agreed: *"fintechs are faster to respond to the needs of the consumers than the banks"*.

IE5 asserted that *"fintechs are very agile, and they can risk. One of the biggest differences is in the risk appetite. They are less risk-averse than traditional banks. They are younger than the older banks, which means they have got fewer overheads, they run on much lower operating costs"*. FE2 also believes incumbents' legacy system is a considerable hindrance that prevents them from being agile and said, "*there is lots of governance, lots of red tape, lots of bureaucracy. So, the speed at which they (incumbents) can do new things is slower than the speed at which we (fintech) can do new things. Their risk appetite is very different to what our risk appetite is because they've got a lot more to protect and a lot more to lose than we do. Incumbents have years of legacy that they have built up. They have got years of protocol"*.

FE4 first acknowledged the disruptive impact of fintech in the financial services industry and then attributed the slowness of incumbents to the legacy systems they have built over the years and argued that *"fintechs have had a massively disruptive effect on the traditional financial services sector and I mean there are many, many examples of that. So, they have been quite disruptive where your traditional financial services players are slower to respond. Uh, where they do not, because of the legacy systems and culture. The challenge in bigger organisations is that they move slowly because of their legacy systems and all the approval processes and because they have complex business. To make a small change impacts a lot of different areas."* RE1 also believes the legacy systems are affecting incumbents' agility and argued: "*I think one of the challenges is that if you look at an entity, like a bank, especially a bank that has been around for several years, or even decades, is they have kind of legacy systems. I want to refer to it as a legacy operating model. So, if you look at the big banks in South Africa, they still got kind of a large branch network, they have got legacy IT systems that they've kind of tweaked over several years or even decades, and built up, costing hundreds of millions, if not billions, of rands."* RE3 also blamed incumbents' processes as a hindrance to agility and said, *"they've got very strict processes in terms of HR (human resource) processes, risk management processes, all kinds of compliance requirements, etc., which makes them a little bit less flexible to address certain market segments, effectively."*

Based on the responses, it can be concluded that fintechs are more agile and react faster than incumbents. Legacy systems that have been in place for many years are the primary cause of incumbents' inability to be agile and respond quickly. This supports Gomber, Koch, and

Siering (2017)'s claim that incumbents are less agile than fintechs, which can quickly adapt their products or expand their services into new markets. Because of their agility, fintechs can provide quick access to a diverse range of affordable products and services (Elsaid, 2021). IE7 concluded: *"I think it is not a great experience for us (incumbents) from the banking sector"*.

Theme 1B: Regulatory challenges presented by fintechs

Traditionally, the financial services industry has been subject to strict regulations. However, the emergence of fintech companies that lack prior experience with financial regulators has resulted in instances of non-compliance (Alblooshi, 2022). As a result, the financial services regulation has been adversely impacted by this situation (Tsindeliani et al., 2022).

The industry experts interviewed concurred with the aforementioned. IE4 believe that one of the reasons for this is that "*fintechs are not regulated like banks are. While they play in financial services, they do not have the same level of burden in terms of regulatory reporting requirements. And so, we (incumbents) spend a lot of time reporting to the regulator, making sure that we are meeting the regulators' requirements"*.

FE6 argued that *"the biggest challenge is that this industry (fintech) is unregulated"*. In support, FE3 claimed that *"in SA, I haven't seen any specific regulation relating to fintech", and* IE6 retorted: *"You cannot really regulate these things (fintechs)"*. RE3 added: *"They (fintechs) are often new startups and the people who have good ideas but have got very little knowledge of how the regulatory framework works, what the rules of the game are"*. Consequently, according to IE7, *"fintechs introduce some risk in the system. And the problem is that this risk is introduced into the system without any measure to mitigate it. I do not think the fintechs or ourselves (incumbents) have put systems and processes in place to deal with some risks that we see that come with this new technology"*. In agreement, Xu, Tang and Guttman (2019) argued that since some fintechs fall outside of the traditional regulatory framework, the lack of oversight into fintechs allows other fintechs to operate in what IE8 called *"the regulatory blind spot"*. Therefore, in accord with IE8, "*they (fintech) can get away with having very light or low regulatory oversight. Yet they compete with the incumbents, which almost creates an unfair playing field. That is where we are moving away from competitive positioning to arbitrage and invariably creates a risk to the system that you know will come back and cost the whole reputation of the industry"*.

To address these challenges, it may be necessary for regulators to broaden their scope of regulation to encompass fintech companies, as suggested by Coetzee (2018). In accordance, IE9 reported that *"as a way of living changes, the way we deliver services changes, then will come new types of risks, which again, requires new types of regulations. Previously, it was not necessary; regulators knew what was out there. And they could ensure that they (financial institution) are regulated appropriately. But nowadays, as I say, there are just too many areas within which regulatory development can take place"*. Some areas of the industry remain unregulated, and IE6 argued that "*It's been years now, but they (regulators) have not figured out how they would regulate Bitcoins*". RE1 believes it is not only Bitcoins which lack regulatory oversight but the whole cryptocurrency market: *"I think the challenge here in South Africa is, as we are speaking today, crypto assets remain largely unregulated because none of the existing financial sector laws or the legacy financial sector laws explicitly cater for something like crypto assets. The challenge is how do you appropriately amend that, to bring them in the industry without any unintended consequences"*.

Due to this lack of a regulatory framework, IE4 cautioned: "*I am seeing that adverse parties have also grabbed onto that technology, and they are misusing it. We often get feedback from our clients that they thought they were investing in cryptocurrency, and it was a scam, and they have lost money. So, in as much as new technologies can transform the industry positively, they can bring in rent-seeking behaviour that really hurts our clients"*. Further, the risks that come with cryptocurrencies like Bitcoin have caused a lot of uncertainty for the incumbent banks as a result, pursuant to RE1 *"in South Africa, banks are unsure of what they are allowed to do. Even if they are not explicitly disallowed or not allowed to do it, the banks kind of being, I suppose, prudent or cautious by nature, they rather defer and be on the side of being cautious and not engage in an activity rather than potentially engaging in something that they should not. So, until there is regulatory clarity, the banks are going to be reluctant to accept cryptocurrency. As a result, many of the banks have de-risked some of the crypto assets, service providers and crypto asset players because they have difficulty pricing the risk because of the lack of regulatory clarity"*.

RE2 added screen scraping as another risk introduced into the industry by fintechs due to regulatory limitations. He explained: *"What is behind all of that is what you call a screen*

scraper. A screen scraper is someone we employ to impersonate you. So, when you log on and your bank appears, and then you put in your login details and everything, you think you are in control, but there is someone in charge. What is called a screen scraper is the one who is facilitating that whole payment experience for you. So, the risk with that is that your account information can be compromised. Your data can be compromised, a lot of things can happen, and you can be defrauded".

There are several issues that fintechs present in the financial services industry, particularly in lending. One of the biggest concerns is the increased risk of fraud that comes with fintechs' involvement in this area. FE1 argued: "*as you move to the digital platform, the increase in fraud is a lot higher because people can, and they are very ingenious when it comes to changing their documentation in order to, especially in the lending space, to receive the maximum amount of credi*t". In the banking space, RE3 added: *"I think, the one part that we are sometimes criticised about is that we do not have an entry-level bank license for fintechs in South Africa so that they can also take limited deposits. Some countries overseas have that kind of license".* As a result, fintechs are currently unable to participate in this space without the aid of a sponsor bank.

Most of the regulatory challenges can be attributed to the fact that *"regulation will always lag innovation,"* as explained by RE1. RE2 concurred and reported that "*there are a lot of innovations and developments that are happening in the financial space. And as a result, you find that regulators are always caught off guard and behind the curve".* RE1 elaborated on this point by saying: "*I think the emerging challenge for the regulators is, I think, with the pace of both technological and innovative change we are sitting with an emerging challenge, where things are changing quicker than they did twenty or thirty, or forty, or fifty years ago. The banks have been around for hundreds of years, and the regulators or supervisors have thoroughly had centuries to perfect the technique of regulating and supervising banks. And we do not have that luxury in the fintech space because the environment is much faster-paced, and it evolves and develops much quicker. So now the problem we have is that historically, and this has always been the case, and it is almost impossible to get away from it, is that regulation will always lag innovation. And so, especially maybe in the South African context, depending on the level at which we need to amend legislation or regulation, it might take anywhere from a few months to a few years to amend the legislation, and by that time, the market may have*

evolved into a different direction, or they may have been different developments that could not be captured even by amended regulation".

Industry experts provided substantial evidence suggesting that fintechs are presenting a challenge to the current regulatory framework for financial services. These claims support the arguments made by authors like Kaal and Vermeulen (2016) and Tsindeliani et al. (2022), who contend that fintechs have brought forth multiple new regulatory challenges, leading to regulatory uncertainty in the financial services industry.

Theme 1C: Benefits presented by the fintechs

Fintechs, among other things, are developing new business models, customer demands, and expectations (Drasch, Schweizer and Urbach, 2018), allowing people to gain greater control over their finances and disrupting industry fundamentals (Arner, Barberis and Buckley, 2017; Anagnostopoulos, 2018). Fintechs enable new entrants (non-banks) to enter the market (Buckley, Arner and Barberis, 2016), broaden access to new market segments and customers (Mazambani and Mutambara, 2019), and increase diversity by providing services to customers overlooked by incumbents (Jagtiani and Lemieux, 2018; Mungai and Bayat, 2018; International Monetary Fund- African Department, 2019).

When asked if the rise of fintechs has positively impacted the financial services industry, industry experts agreed that fintechs provide several benefits, especially for customers. Their services *"focus on the pain points for customers"* (IE2) and *"solve clients' problems by revolutionising the way we do business", "by lowering the cost of doing business, improving efficiency, and quite importantly, improving client experience"* (IE4), *I think they (fintechs) also bring more choices for the consumer. So, if I am unhappy with my bank, I have got another option"* (IE7).

Industry experts interviewed identified several positive impacts that fintechs are bringing to the financial services industry:

- Financial inclusion.
- New growth opportunities.
- Increasing choices for the consumers and making the industry more competitive.
- Reducing costs.

- Customising financial services.
- Bringing convenience (removing the question of space and time).
- Forcing the incumbents and regulators to become more innovative.

Financial inclusion

FE2 posited that "*the biggest role fintechs or digital banks play is around creating access. Financial inclusion and access for mass customers are massively important to us, it will always be the reason why we started the (fintech) bank".* IE5 added: *"fintech opens the industry. It gives more people in the country more access to financial products like more access to loans",* and *"once we are able to reach more people, we're able to encourage economic trade, and we're able to encourage participation and financial inclusion, and we are able to alleviate poverty"* (IE7). In support, RE3 claimed: *"a lot of customers have been brought on board that would otherwise have not been able to get an easy access to the national payment system".* For example: *"people who stay in rural areas who could not access financial services, can access it now because of fintechs"* (FE5). This shows that *"different fintechs can actually help and assist the banks to increase financial inclusion for all the people of South Africa"* (FE6). IE7 contended: "*Remember, if people can participate in the economy, people are able to trade much easier, better, and cheaper. And then it does have a positive effect on the economy itself because it speaks directly to things like financial inclusion".*

IE7 elaborated: *"In South Africa, we have got a problem with people that are underbanked. It is believed that fifteen million people in South Africa are bankable. And when we say they are bankable, we mean that they are valuable clients from a customer lifetime value perspective and the customers that would lend, that would trade, that would get salaries, et cetera. Therefore, it is important to encourage greater participation. It is important for us to open more flows with which payments can flow. If you think about the township economy or rural areas, all we must do is open those floors... There is a big industry project now called rapid payments, and effectively it wants to digitise low-value high-frequency payments because it is believed that in South Africa, nine out of ten payments are made in cash. And the average amount spent is, I think, under one hundred and fifty rands (R150). So, that is significant because it says that people want to trade. And what we know is that people do hold debit cards even more than one, but they do not use them. You know, when you are at the township, you*

can see that there is a speed point, but when you ask to use it, the owner says, no, do not use it. Pay me in cash. Those are the things that we are talking about when we talk about disruption and economic participation in the under-banked, et cetera, that we need to solve".

In agreement, RE2 argued: "*They (fintech) are going to areas where the incumbents cannot normally go because the incumbents normally perceive that area margin-wise to be very thin. So, these guys can go there and take advantage of that market and revolutionise that market".* RE2 continued: *"I mean, some of these fintechs, for example, can lend to SMEs. They always say SMEs are the backbone of every economy, and if you want a great economy, you must grow the SME sector. And we know in South Africa how SMEs struggle to get financing from traditional banks, but these fintechs are willing to lend to them. And you see these SMEs growing so much because of the finance they get from these fintechs. So, they are driving growth in the financial sector, which is also trickling down to the real sector of the economy".* In addition, IE8 argued that *"they (fintechs) effectively facilitate money flow and facilitate granting of credit, which then stimulates the economy".* RE3 added: *"there are 100,000 new merchants that have access to the payment systems and accept card payments that otherwise would not have taken place with the banks".*

The preceding arguments corroborate that fintechs benefit consumers, other industry participants and the industry by expanding the industry reach, thus benefiting economic growth. This also support Senyo and Osabutey (2020) and Magnuson (2018) assertions that fintechs open new markets by extending financial services to places previously excluded by traditional financial institutions or to underserved customers. RE1 emphasised the importance of inclusion and asserted that "*by including more people in the economy, you are strengthening financial stability because you diversify and broaden the base. It has got potential benefits from a tax and social development perspectives, obviously massive impacts".* IE9 reiterated: *"I think it (fintech) creates new opportunities, and similarly, I think for banks, and for the whole financial sector, the fact that we will be able to use all these new technologies, everything from artificial intelligence to blockchain and cloud, etc., really gives us new opportunities in terms of how we provide services to our customers".*

New growth opportunities

As reported by industry experts, fintechs offer the financial services industry and the entire economy new opportunities for economic growth. FE2 argued*: "Fintechs will provide more growth opportunities because their focus is around speed to market and innovation at the product level"*. FE3 added: "*The economic opportunity is that they play a role in enabling an economy. They can enable the economy by providing services that may not necessarily be available in the traditional sense"*. IE7 contended: *"if people can participate in the economy, people are able to trade much easier, better, and cheaper. And then it does have a positive effect on the economy itself"*. RE2 added: *"If you want a great economy, you must grow the SME sector. We know in South Africa how SMEs struggle to get financing from traditional banks, but these fintechs are willing to lend to them; and you see these SMEs growing so much because of the finance they get from these fintechs"*.

These arguments strengthen the argument that fintechs play an essential role in the growth of the economy. RE2 argued: *We have got fintech companies that are manufacturing point-of-sale (POS) devices that are being used by spaza shops (a term for an informal shop often operated from a private house) and people in the salons. So, sooner or later, you will find that these POS devices are everywhere, and we become a cashless society"*. In doing so, the fintechs are helping these SMEs to grow, which has a ripple effect on the growth of the economy.

Fintech companies are aiding the growth of small and medium-sized enterprises, leading to a positive impact on the economy. This aligns with Zvirgzdina and Skadina (2019) stance that financial institutions are leveraging technology to create innovative solutions that increase business prospects and explore new markets, surpassing conventional limitations.

Increasing choices for consumers and making the industry more competitive

FE5 argued that *"the main impact, without referencing any specific data at the moment, is that these new entrants are just increasing the amount of competition within the market or the financial services space"*. RE3 and FE2 argued that increased competition and the variety of choices brought by fintechs are particularly important for the industry's growth. FE2 argued

that *"in my mind, there is nothing more powerful than the choice for people. Multiple choice when trying to decide, I think that is massively important. So, fintechs add one more aspect of choice to the end-user. That is good for competition. That is good for everything"*.

IE7 agreed and added that *"increased competition is great for any market"*. RE3 elaborated: *"If I look back over the decades that I have been involved in payments in South Africa. In about the med-nineties or even the early nineties, payments were 100 percent in a bank's gain. So only banks were involved in payments. In fact, they controlled the value chain end to end. They were about two or three bureau services that did debit orders. But they were associated with the big insurance companies…If we look at where we are now. There are thirty-two banks that are involved in the payment system. And there are three designated clearing participants that are not banks that are in the clearing system. And there are a few more that are in the pipeline that I am aware of. There are over one hundred, what we call system operators; those are infrastructure providers in the payment system, and over three hundred payment service providers and TPPP (third-party payment providers).*

So, if you add those together, you are talking about over four hundred companies that are now playing or involved in the payments value chain. And obviously, a lot of them are making very good money. In fact, some of them have been super profitable, making hundreds of millions of rands profits every year. So that just shows how the payment system has changed. And in my view, obviously for the good. Because they bring a lot of services, a lot of infrastructures, and a lot of support to the national payment system that banks would not always have been able to do themselves. So that is why a lot of fintechs have been able to find pieces in the value chain where there is a gap, or there is an underserviced environment that they have been able to follow very effectively. In my view, they complement the work of the banks, especially in the clearing system, very well. So, because of these efforts, I think the national payment systems are benefitting".

Thus, IE4 asserted: *"The financial services industry has become competitive"*. This agrees with Hornuf and Haddad (2018) that fintechs are introducing new products and industry participants, thereby making the industry more competitive.

Reducing costs

FE3 posited: *"Through fintech, you can eliminate a lot of your operational cost"*. Therefore, in tandem, IE5 and FE1 contended that *"because of their (fintechs) cost structure, they are able to then charge less price and attract more customers"*. FE3 added that *"our (fintech's) price point for customers in terms of being able to transact is very much lower"*. FE6 supplemented: *"Our (fintech's) offering to customers is much more than what the banks can do, e.g., our fee structures… they (incumbents) will not get there because they are too expensive. They (incumbents) cannot do these payments for that same fee we are asking our customers"*. Thanks to financial technologies, financial institutions can lower their operational expenses, enabling them to provide more cost-effective financial services and products to customers.

This corroborates the assertions of Gomber, Koch and Siering (2017) that fintechs create affordable and cost-effective technology-based business models. Therefore, they can reduce services and product fees. Pursuant to Maskey (2018), financial technologies such as artificial intelligence, are expected to save the banking industry approximately $1 trillion in costs by 2030. In addition, in accordance with AutonomousNext (2018), fintechs are expected to save the industry up to 1.2 trillion US dollars by 2035. These savings are expected to come from various parts of the financial services value chain, including the front office, branches, and back office.

Customising financial services

In the manner of IE9, *"Technology has fundamentally changed the way people live. And therefore, you must ensure that you reach them and that your services really give them value in the way they want to receive it"*. Therefore, FE5 added: *"Fintechs are helping to rethink what the overall customer experience looks like and feels like"*, and, according to FE4, *"through technology you are able to offer better services and propositions to customers"*. RE2 agreed: *"They (fintechs) are offering them (consumers) personalised products"*. RE2 added: *"We are already seeing the revolution in the insurance sector. We are seeing that now, data of people generated is being used to assess risk. People are no longer doing the risk assessment based on just looking at age and gender. People are being risk-rated based on their behaviour"*. In corroboration, in accordance with Lenz (2016), Truong (2016), and Vasiljeva

and Lukanova (2016), fintechs have altered the expectations and demands of consumers towards financial services providers. These companies offer innovative products and services that enhance and customise the customer experience while also increasing process efficiency and transaction speed. In the lending space, fintech platforms use AI and big data to gather personal information about customers for lending decisions, while traditional institutions rely on credit scores and explicit/implicit information. As a result, they offer customised credit scores that reflect individual creditworthiness.

Bringing convenience (removing the question of space and time)

"Fintechs have simplified banking" (IE2). They have broken down the barriers of space and time in banking, allowing people to bank from anywhere and anytime (Lin et al., 2018). People can now choose whether to visit a bank branch or access services on their phones or other electronic devices, thanks to fintechs (Buckley, Arner and Barberis, 2016). The findings corroborated this view. IE7 concurred: *"If you think about it, you had to go to the bank branch for everything then (in the past). We must justify having a human and branches now because fintechs are there, and typically, financial services are delivered through your handset. The need to do a whole lot of those things at the branch is no longer there". "Fintechs provide convenience. There was a point when I had to go to a branch to do these things, but now I can do it here. It is at my fingertips. Yes, there was a point where I had to carry cards in my wallet, but now they are digital"* (IE6). RE2 agreed and said, "*the bottom line is fintechs are offering consumers convenience…they are enhancing the customer experience"*. This corroborated the findings of Stoica, Mehdian and Sargu (2015) that fintechs improve customer convenience by making transactions easier and faster. As a result, in accord with FE2: *"people have realised the amount of value and convenience digital adds to their lives"* (FE2), and this has reshaped customers' expectations and as a result customers have started demanding higher standards for user experience (CFA Institute Asia-Pacific Research Exchange, 2017).

Forcing the incumbents and regulators to become more innovative

In agreement with Eurosystem (2015) and Hornuf and Haddad (2018), the industry experts posited that fintechs are introducing new business models and forcing other industry players like incumbents and regulators to become more innovative. In agreement, IE7 posited, *"I think*

they (fintechs) also force us (incumbents) to innovate in the sense that, as I said, from a regulatory perspective, if the status quo remained the same, nobody would feel the need to do anything. However, we have got a regulator that is now forced to regulate new technologies, new capabilities and all these things because the fintechs are putting these things in the hands of consumers. And once it is in the hands of consumers, you have this bottom-up push to change". Part of innovation is the introduction of the customised consumer experience. Fintechs have helped to personalise services and products to the needs of each customer. They reduce the use of a one-size-fits-all approach to service delivery (Vasiljeva and Lukanova, 2016). As a result, incumbents have been compelled to offer similar individualised services and products.

EI7 agreed and added: *"fintechs are also encouraging some very unique customer experiences in the sense that when a bank collaborates with a retailer like a Shoprite; now you are able to do cash in, cash out, whilst you do your grocery".*

4.3.2. Theme 2: Responses to fintechs

Innovations have the potential to disrupt entire industries, presenting challenges for established businesses and regulators alike. Incumbents are forced to respond in order to protect their market share, while regulators need to balance stability and progress. Both parties must approach the situation with caution to ensure that the industry remains competitive (Charitou and Markides, 2003; Coetzee, 2019).

Fintech's changes have positive and negative impacts on the financial services industry. As a result, industry participants like financial regulators and incumbent financial institutions must figure out how to adapt to these developments. Both regulators and incumbents must capitalise on and amplify the positive impact. On the other hand, regulators and incumbents must discover strategies to mitigate the negative impact. Incumbent financial institutions should incorporate fintech innovations into their strategy (Eurosystem, 2015) by developing strategic alliances with them (Wagner et al., 2016) or acquiring fintechs and investing in technology-related skills and knowledge to utilise the fintech's expertise.

Industry experts were asked to provide insights on how traditional financial institutions and regulators in South Africa respond to fintechs disruptions. The goal was to determine if they use any unique tactics to address the impact of fintechs. In the next section, the responses are explored. These responses were divided into responses by incumbents and responses by regulators.

Theme 2A: Response by incumbents

Incumbent financial institutions feel the effect of the fintechs as they increasingly impose themselves and their offerings. The expectations of consumers from financial services institutions have also changed. IE5 opined, *"Human behaviour is changing already, and beyond banks, all companies must change how they deliver the product. And the banks must change how they deliver their products and services too"*. As stated by RE2, *"This forces the incumbents to reimagine their operating models because if they do not, their margins will be seriously squeezed"*. IE6 unequivocally stated: *"As we speak today, banks need to rethink their role going forward because they may be irrelevant in the future"*. IE1 conceded and said, *"We (incumbents) cannot continue doing things the way we have done before. Deepening the focus and ensuring that we make the lives of our customers easier and more digitally oriented will be the solution. So even when designing products now, some are digitally based; even when we think of how people can engage with us, we have started creating chatbots"*. IE4 agreed and added that *"fintech innovation causes us as banks to accelerate our own innovation plans,"* and *banks are reinventing themselves"* (IE5). IE2 approved and stated: *"We (incumbents) are trying to become fintechs"*.

IE6 cautioned: *"I think long term it would be suicidal to offer the current products and services for the next generation. I think change is forced upon us. We must evolve, and we must reinvent banking and our role in society"*. In support, IE8 emphasised: *"We are not being complacent. We recognise that we are competing globally with fintechs that are operating across global"*. RE2 assured that *"they (incumbents) are coming up with a new way of operating in order to respond to these fintechs"*. In agreement, RE3 contended *"the banks themselves are also changing their systems to be more innovative. They are not staying static. I think they also realise that they must change"*.

Financial services experts interviewed identified several common strategies used by incumbents to mitigate the negative impact of fintechs disruption. These strategies include:

- Interoperability and partnering with fintechs.
- Expanding the role of the bank.
- Upskilling staff so that they are ready for the industry changes.
- Improving customer experience.
- Copying the fintechs and acquiring the fintechs.
- Reducing the costs of financial products and services.

Interoperability and partnering with the fintechs

The experts argued that the incumbents embrace fintechs and partner with them and other organisations like retail stores and telecoms to improve the consumer experience. Supporting this argument, IE1 contended: *"My sense is if you want to grow and you want to go and scale faster, you need to partner with good fintechs"*. A statement that IE7 agreed with: *"I would say a lot of times you cannot go at it alone. Partnerships will make all of us win. So, the incumbents must find good partners. It might be retailers, et cetera. Partnerships are going to make all of us win because the reality is that no one can go into it alone, so banks cannot do it alone, the same way fintechs must quickly realise they cannot do it alone"*. RE3 argued: *"the incumbents use the technology of the fintech to expand their footprint"*. This creates what IE2 called *"shared value"*. IE8 added: *"We are very supportive of situations where we can partner"*. In tandem, IE2 agreed: *"That's why we are saying we will compete with fintechs, and we will partner with them at the same time where we believe they can fast track our competitiveness"*.

RE3 argued that *"interoperability is extremely important to become successful"*. IE8 emphasised the importance of partnerships and said, *"fintechs by nature need banks to manage their own banking relationships or to be sponsored into the banking ecosystem… we partner with fintechs where we believe it makes business sense, to improve the client experience that we trying to offer… We have recently bought a fintech which is in the market of solving problems for the supply chain from FMCG (Fast-Moving Consumer Goods) companies operating in the informal economy, the spaza shops"*. IE4 added: *"We have a lot of partnerships with big (tech) companies like Amazon"*. IE8 cautioned: *"incumbents that do not*

embrace the concepts behind fintech and partner with fintechs, I think they will be impacted (negatively). But incumbents that can embrace the thinking, the concepts, and the partnership approach I think, will be stronger and even more relevant".

These relationships do not only benefit the incumbents; RE3 argued that *"banks also give fintechs access to large numbers of customers through their networks".* This corroborated the assertion by Holmes and King (2019) that banks provide fintechs with support, experience, established customer bases and distribution networks, while fintechs bring innovation capabilities in these partnerships. Camarate and Brinckmann (2019) supported this claim, stating that all parties involved benefit from these collaborations. For instance, FE3 posited that "*fintechs in the payment space have to be affiliated with a traditional bank in the background to support their effort".* This is because in South Africa, regulations mandate that non-banks seeking to offer payment services that involve pooling funds from consumers must collaborate with banks.

Eurosystem (2015) and Wagner et al. (2016) corroborates and suggest that incumbent companies should integrate fintechs into their business strategy by forming strategic partnerships or acquiring fintech companies. It is also recommended that they invest in technology-related skills and knowledge to effectively leverage fintech expertise.

Expanding the role of the bank

Experts in the industry suggested that traditional banks are adopting new strategies to broaden their scope and function beyond traditional financial services. Their goal is to transform into one-stop shops where customers can access a variety of services beyond banking. IE3 claimed that *"if you come into the banking environment, you do not want to do banking only, you want to do various other things as well. We could join up with the travel industry. You can buy your tickets through us. We can insure you for your travel. We can help you book your hotel. We can get your transfers, and everything just by coming to the bank or coming onto our platform. This means that we are more than a bank. We are not just the bank anymore, and we describe that as more. So, it is like a shopping mall. You come into our bank as a mall… This is how we are responding to the disruption. The bank is becoming a platform business with ecosystems for homes, ecosystems for business, ecosystems for travel and etc".*

IE2 agreed and stated: *"As time goes on, we are redefining what should a branch exist to do in the future. The branch will become a coffee shop. It will become a place to do complex deals and will become a place to negotiate very big deals, not to open a bank account"*. IE5 echoed: *"What it looks like now and the services it (the bank) provides will be different. Maybe ten years from now, you will be able to do other things more than just banking. The bank wants to be a shopping centre. In the shopping centre, you are just the branch. Currently, people come in, transact, and get money, and they go out and, then they go shopping. They come there to withdraw money, and they go, or they come there to deposit money and they go. In the future and the near future, not like far, five, ten years from now, the bank wants to be the shopping centre so that if you go there, there's a section of money, a different section that's still part of the platform where you can buy clothes…If you go buy clothes, you are still in the ecosystem of the bank because all those are linked to the bank through technology"*. IE6 concurred: *"We launched a platform, which is currently a marketplace. You can buy whatever you want on this platform. But it should evolve into something bigger than Amazon's competitors. Ideally, it should be the bank of the future where you get to do everything finance-related on this platform"*.

Furthermore, IE8 added: *"We do not see ourselves as operating in banking (only). If you listen to our group CEO, we are effectively doing two things right. We want to be a leading integrated client-centric financial services provider. So, we want to be relevant across the banking, insurance, and investment needs as well as being a lifestyle provider. If you think about a lot of the things we do, you know it is also about how we add value to clients' lives outside of formal banking products or investment or insurance products. I mean that you can renew your car license on our platform, get your smart ID (Identity Document) renewed in a branch, pay your traffic fines, or sell your car on a marketplace between trusted parties... We are also the largest MVNO (mobile virtual network operator) in the country in terms of providing telco-services to our clients now. A lot of what we are doing in terms of being able to provide clients capabilities across a range of things is because we are thinking like a fintech. Because we think why fintechs can grab a space. It is because they appeal to a specific need of clients that maybe we (incumbents) are not addressing. They are looking to be very client-centric in addressing that need, whether it is payments or lending or insurance or investments. But if you think about our approach to how we trying to disrupt the insurance industry or, the investment industry or the telco industry, we are effectively using that same approach. We could say we are a big*

insurtech, or a big investech or a big telcotech". These findings are consistent with the assertion of KPMG (2022), that the bank of the future aims to offer a comprehensive customer experience that encompasses financial services as a component of a broader package.

Upskilling staff so that they are ready for the industry changes

Industry experts also posited that the incumbents are upskilling their staff to be ready for the fintech revolution. IE4 contended that *"the skills that we needed in the second and the third industrial revolution were very much physically based skills…The skills that we need going into the fourth industrial revolution are very different. You need to be able to analyse data. You need to be able to code. You need to be able to function in a technology-based world. And so, I think we are going to need a different set of skills. Not necessarily the skills that we needed as a traditional bank,"* and IE3 added: "*We need leaders who can lead this transformation because nothing is long term anymore".* In support, IE4 reported: "*We have backed on many programs to up-skill our staff. You know, you hear internally that there is a lot of conversation about personnel development. There is a lot of conversation about learning about what is cloud and what does it mean. We are really up-skilling our staff to make sure that they continue to be relevant as we change the way we do business. So yes, somebody might be working in a branch today, but we are in the process of upskilling people so that tomorrow they might be the person analysing data or facilitating online interactions with clients. I do think if we are not proactive, and do things like that, like upskilling our staff and teaching them how to work in a technology-enabled world there is a risk that people get left behind".* In tandem, IE8 added: *"We believe for the next few decades we will invest in as much in people as we invest in tech".* These findings support the argument of Wagner et al. (2016) that incumbents must invest in technology-related skills to be able to compete with fintechs.

Improving customer experience

In response to the disruption by fintechs, the industry experts also stated that their organisations are paying greater attention to customer experience, emphasising the importance of being customer-centric businesses. IE4 argued: "*We are doing two things- focus on clients and client experience. Those are the two main things. Technology is easy to duplicate. Anyone can buy technology, but it is not easy to replicate a relationship with a client. So, I see a strong focus among the incumbents on deepening relationships with our clients".* Banks are making efforts

to improve their customer experience by offering digital assistance to their clients. Some have made their banking apps easily accessible by providing zero-rated data usage, which allows customers to transact without using any data or airtime. Additionally, some banks are also considering providing customers with smartphones and SIM (Subscriber Identity Module) cards to further enhance their digital journey. IE2 stated: "*What we want to do is when you open your bank account, we give you a SIM card, a phone, a bank account, and the app that is already active with a virtual card. We give you the card immediately, so you got a bank in your hands. We call it bank everywhere".* FE4 added*: "Obviously access to data is not any better. That is why we have zero-rated the app".*

Copying the fintechs and acquiring the fintechs

Industry experts argued that incumbents sometimes copy fintech companies as part of their response strategies. FE5 posited: *"The incumbents are trying to be seen to be just as innovative and are trying to launch similar copycat products…They are also starting to adopt some of the business model aspects of fintech companies".* FE2 added: *"Standard Bank has signed a deal with Pick n Pay to be inside their stores. You will also see that ABSA has built a kiosk like that of Tymebank…So, it is obvious they have seen that the model works, so they want to replicate it".* FE5 contended: *"Incumbents are starting to offer platforms like fintechs".* Industry experts have noted that in addition to emulating fintech companies, incumbents are also acquiring fintech companies to benefit from their innovation. FE3 argued: *"the traditional banks in South Africa tend to acquire fintechs companies".* RE2 reiterated: *"some of these incumbents are buying the fintech companies and are putting them on their platforms. You might have seen it lately; FNB just bought this payment fintech. Its target is spaza shops and SMEs because they want to capture that market also".*

Reducing the costs of financial products and services

Industry experts agreed that fintechs are lowering the costs of financial products and services to undercut the incumbents. When asked about incumbents' response strategies to this threat, the industry experts contended that incumbents are lowering their prices to compete effectively. IE5 confirmed: *"We are starting to reduce our costs. One of the biggest flaws of traditional banks is bank charges…We are starting to have accounts where you pay nothing if you do not transact or pay as you transact. We have never had those kinds of things. We would charge*

you an arm and a leg whether you use that account or not in the past". To do this successfully, the banks are reinventing themselves and are looking for solutions that are going to help them reduce their charges. FE5 maintained that *"incumbents are starting to adopt business models of the fintech and dropping monthly account fees"*. RE3 added: *"The banks are developing a system called instant payment system, which is going to be very low cost and which you can run off your cell phone"*. Furthermore, FE5 argued: *"The banks have actively been consolidating or reducing their branch footprint… So, they are trying to optimise and save cash by reducing their branch footprint, but still, ensure that their customers can conduct whatever key services to be done through the alternative means or channels"*.

Theme 2B: Responses by regulatory

Fintechs have accelerated the pace of change in the financial services industry, making it difficult for regulators to keep up. Consequently, there are threats to the financial system's stability (Elia, Stefanelli and Ferilli, 2022). One of the reasons is that fintechs are not covered by the current regulatory framework. This, in turn, has a detrimental impact on incumbents since it creates an imbalance because incumbents, on the other hand, are subjected to strict regulatory requirements (Nguyen, Tran and Ho, 2021).

Industry experts were asked to provide insights into the regulatory response strategies towards fintechs disruptions in South Africa. The industry experts corroborated the observations of authors such as Elia, Stefanelli and Ferilli (2022) and Nguyen, Tran and Ho, (2021) that fintechs have brought severe regulatory challenges to the industry. IE2 agreed and contended that *"regulation has not caught up to them (fintech)"*. IE5 added: *"Regulators are watching the big banks more than fintechs"*. This scenario puts incumbent businesses at a disadvantage as they invest significant resources to ensure compliance while their competitors are not subjected to the same restrictions. To address this issue, IE9 argued: *"I think from a regulatory perspective, similarly, I think that as technology advances, as the way in which we deliver products and services to our customers change, regulations fundamentally must aim to identify potential risks and ensure that appropriate controls are being put in place to mitigate those risks"*.

In response to the changing landscape, IE1 contended that *"regulators tend to fall into at least two buckets. There are regulators that take a wait-and-see approach, and there are regulators that are progressive, that look ahead".* IE9 argued: *Some people have the view that regulators almost need to pre-empt what is going to happen. But I think at the current pace of change, there are just so many new things that are happening from a financial services perspective. It is unrealistic to expect regulators to be able to anticipate any form of innovation in their field".*

The regulator in South Africa is using the following approaches to mitigate the negative impact of fintechs:

- Special task teams.
- The Innovation Hub.
- Regulatory sandboxes.

Special task teams

The South African Reserve Bank, in response to the changes in the payment space, established the National Payment System Framework and Strategy Vision 2025. The vision of this initiative is to "enhance the safety, efficiency and accessibility of the national payment system in a manner that promotes competition and minimises risk to the payments ecosystem by leveraging technological developments to extend the availability of digital payment services to all sectors of society while meeting domestic, regional and international requirements for the benefit of all members of South African society" (South African Reserve Bank, 2020:3). Amongst other things, payment fintechs must register with payment association of South Africa (PASA) and be approved as a third-party payment provider and/or a systems operator (SO) and all non-banks who want to participate in the payment industry must partner with a sponsor bank (Deloitte, 2022). IE7 argued: "*Our regulators realised that if they want to facilitate innovation in the country, they have to put all this infrastructure and processes in place".*

The industry experts' findings corroborated this. FE4 postulated that "*the payment is a good example where payments are governed by the South African Reserve Bank, which has mandated the PASA to govern the payments industry".* As part of this regulation, IE2 contended that *"for fintechs to really play in the payment space, they need a sponsor bank."* In agreement, IE7 posited that *"up until now, as we speak, the fintech, have not been allowed to participate*

directly in the national payment system (on their own). They always need to go through a bank and get a bank to sponsor them so that they can participate". To make things easier, plans are underway to establish a system that will allow more non-banks to participate in the payment space. IE7 and FE5 reported that *"SARB and PASA have set up the rapid payment programme (RPP) as part of SARB vision 2025 modernisation of payments technologies and industries to allow non-banks to participate in the national payment system. This is done to help the fintechs to overcome the regulatory burden and to enforce the regulation through one of the big players (incumbents)".*

To increase fintech participation in financial services, FE5 added that *"the Payment Industry Body (PIB) is another fantastic idea by SARB to be inclusive. With the establishment of PIB, fintechs will also have a seat on the table where rules and compliance are being discussed and enforced".* Another challenge that the fintech industry has brought to the financial services industry is screen scraping. In response, FE5 argued: *"there's a whole new screen scraping body or tasks team at the SARB".*

In accordance with the industry experts interviewed, more specialised bodies have been launched in South Africa to develop the regulatory framework that includes fintechs. FE5 argued: "*The regulator has formed the Intergovernmental Fintech Working Group (IFWG) that cuts across Treasury, Reserve Bank, SARS, NCR (National Credit Regulator), FIC (Financial Intelligence Centre), Competition Commission South Africa and FCSA (Financial Sector Conduct Authority".* RE1 added*: "the IFWG is almost, I don't want to say it's the world first, but I really do want to say it's world-leading in the sense that it provides a collaborative platform for all the various financial sector regulators to come together in the same place and to consider and openly discuss emerging fintech-related issues such as crypto assets. And it is also very much around ensuring that we do not act unilaterally where an individual action by an individual or regulator might have unintended consequences or spillover effects for another financial sector regulator".*

Accordingly, RE2 reiterated: *"We are there to help the FSCA, the regulator, to proactively respond to the changes that are currently happening in the financial space. As you can see, there are a lot of innovations and developments that are happening in the financial space. And as a result, you find that regulators are always caught off-guard; they are always behind the*

curve. So, we are changing that. We want to be in a situation where we can proactively respond to those developments, and work along with the developments to foster innovation and produce policies and regulations that are informed by the developments that are happening in our environment. And then with the information that we have, then we will be able to inform the departments within the organisation as to what can they respond to, what can they do". In the manner of RE3, South Africa also has the *"National payment systems department (NPSD) of the Reserve Bank, which is responsible for payment systems regulation. Their mandate is the safety and soundness of the payment system. So, they have got a very strong prudential safety and soundness perspective".* The South African government has also issued a declaration stating that those who provide financial services related to crypto assets must be authorized as a financial services provider or representative and comply with Financial Advisory and Intermediary Services (FAIS) Act requirements. Failure to obtain a license can result in a fine of up to R10 million or imprisonment for up to 10 years, or both (Financial Sector Conduct Authority, 2022).

The Innovation Hub

In addition, pursuant to RE2: *"We have put in place what we call Innovation Hub. So, in this hub, we have got the regulator guidance unit, whereby if you launch a new product and want to navigate the landscape, you will come to us, and we will provide advice. And just to highlight, what we find out most is that 80 percent of the fintechs that come and ask for advice from us fit within the current framework. So, we can send them to relevant people who can help them; it is only 20 percent that you find that do not fit in the current framework. And those are the ones that we normally refer to the sandboxes so that their products can be tested because there are no frameworks that cater for them, or they challenge the current framework".*

Regulatory sandboxes

IE 7 contended: *"Regulatory has introduced regulatory sandboxes. This is to say, bring your innovation here, show it to us, and let us evaluate it. And then, we can see if the current regulations are covered adequately. If it does not, we can create additional regulations before you can make it available to customers…. Other regulators call this a test-and-learn type of approach. The second approach is without the use of sandboxes. The regulator says, well, we*

will allow specific products or services to be delivered. And we will closely watch those through our supervision processes, then over time, identify what are the potential risks. These approaches are different to traditional approaches, which were very much like, before you bring new products to the market, we put the new controls in place. But as I say, I think this is not possible anymore, not in the current environment and the pace at which things are changing". IE7 further asserted that *"this enables the fintechs to go and build their products into the various regulations. So, I think that aspect is really advanced in South Africa. There is a help desk where you can phone to find out if you need to go to the sandbox"*. This corroborated the argument of Sangwan et al. (2019) that using regulatory sandboxes offers the right incubation environment for the new entrants in the market.

With all these regulatory interventions, IE4 argued, *"I think regulators are creating an enabling environment for new entrants to come into financial services and keep it a competitive market"*. It is critical for the regulator to keep near the action, even if it cannot foresee the innovation; it must be abreast of or closely track the innovations. Sandboxes have proven to be one of the most effective approaches in this regard. RE1 concurred: *"I think we are seeing that we really must stay close to the market and almost walk side-by-side with the innovators to understand how the market and the ecosystem are evolving. Because if we do not, if we just on our own, go away and come up with a regulatory framework, we probably will not get it quite right because we don't have sufficient and deep insight into the market"*.

In conclusion, RE1 advised the regulator regarding how it should intervene: *"I think we are talking from the central bank perspective; we must be very careful not to create an uneven playing field. We want to ensure a level playing field and follow the principle of the same activity, same rules, same risks, and rules should apply... So, we do not want to unduly advantage fintech startups by subjecting them to a less stringent regulatory treatment to the detriment of the incumbents, but we also do not want to impose such a regulatory burden on the fintech startups with which they cannot comply. It will be prohibitively expensive for them because it is expensive to ensure compliance with the regulation. So, we want to ensure a level playing field by not unduly either advantaging or disadvantaging the incumbents or the fintech startups"*.

4.3.3. Theme 3: Effects of the COVID-19 pandemic

The global outbreak of COVID-19 originating in Wuhan, China in 2019 has caused widespread disruption, leading individuals, and organisations alike to re-evaluate their business strategies. Even the financial services industry has not been immune to its effects. When asked about the impact of COVID-19 on the adoption of fintech, industry experts agreed that it has brought about significant changes. While the pandemic has caused immense harm to people's lives and livelihoods, it has also had a positive impact on the financial services industry. Here are some of the changes brought about by the pandemic:

- Forced the banks to think of alternative ways to deliver their services.
- Forced banks to partner with other industries.
- Accelerated the adoption of online shopping.
- Fast tracked some key industry changes.
- Accelerated fintechs adoption.

The pandemic forced the banks to think of alternative ways to deliver their services: Before the emergence of this pandemic, the banks were over-reliant on their branches to deliver services. However, the emergence of the pandemic pushed them to think about alternative ways to deliver some services. IE2 contended: *"It (pandemic) allowed us to think about what are the things that are pushing customers to go to the branch"*. The banks, therefore, started encouraging customers to access some services outside the branch. IE4 posited: "*We see a change in terms of what clients would be coming to do at the branch because there are some things that they would be able to do themselves. We see more clients doing that. If you think about getting a statement, you no longer need to go to a branch to get it, you can view it on a digital platform"*.

The pandemic forced banks to partner with other industries: IE2: "*COVID-19 forced us to say customers do not need to collect their cards (at the branches). We will deliver them. We have these DSV (a courier company) (De Sammensluttede Vognmænd) lockers at every fuel station. You can get your card there"*. The banks also formed partnerships with retail outlets like Pick 'n Pay so that the customers can collect their new bank cards at the Pick 'n Pay stores. IE2 posited: *"It forced us to think about other partnerships like with Pick 'n Pay. Customers can now collect their cards at Pick 'n Pay"*.

Accelerated adoption of online shopping and mobile payments: Due to lockdown restrictions, people were unable to shop at physical stores, so they resorted to using online shopping. Therefore, the pandemic accelerated the move to online shopping. IE3: *"As much as the pandemic has been bad, it has helped industries transform quicker"*. IE7 stated that *"COVID-19 has fuelled the growth of e-commerce"*. The industry experts also contended that this rise of e-commerce meant people must adopt mobile payment options more than they would under normal circumstances. This demand forced financial services institutions to find more innovative ways to respond. IE7 posited: *"It (the COVID-19 pandemic) forced us to look at our e-commerce value propositions, how we play, how we partner with payment gateways, et cetera"*. IE7 continued: *"Prioritising things like contactless and digital payment capabilities has come forward"*. Consequently, FE5 added: *"There is a lot more electronic payments or tap and go sort of things that have been adopted"*. RE1 also contended: *"The pandemic has accelerated and kind of pushed the impetus for digitalisation for digital payments, whether it is digital identity, verification, or online payments"*.

Fast-tracked some key industry changes: The pandemic fast-tracked key industry changes. It resulted in business model transformation and the replacement of traditional business models and products with new ones. IE3 argued: *"It (the pandemic) changed everything for good. As much as the pandemic has been bad, it has helped industries transform quicker…The digital capabilities dramatically improved"*. IE7 concurred, and posited: *"It (the pandemic) forced us (incumbents) to change much quicker than we thought to bring forward some of the things that were on the back burner that maybe we were planning to do two years from now"*. IE7 continued: *"What we expected to happen four or five years from now has already happened or is happening today"*. RE3 gave an example: *"One of the biggest impacts was the removal of cheques out of the system after many decades of existence, even more than one hundred years. The cheque system was eventually closed on the 1st of January 2021. There were always plans to close this, but because of COVID-19, the move was accelerated"*.

Accelerated fintechs adoption: The pandemic played a significant role in accelerating the adoption of fintechs. RE2: *"The pandemic is going to accelerate the fintech at a greater pace than it was going to naturally evolve when there was no COVID-19"*. IE1 added: *"COVID-19, to a great extent has contributed to the acceleration of digital adoption"*. In support, IE2

asserted that *"it allowed us (incumbents) to accelerate strategies that we had on the shelves like digital adoption"*. In agreement, IE4 stated that *"the amount of growth that we saw in internet banking and the mobile banking app was phenomenal. When people could not leave their homes and were locked down, we really did see an acceleration in the number of people that were adopting digital banking and starting to do their banking online. And we saw that as a true opportunity. We saw more of our clients adopting some of the more innovative solutions that we offered. If you think about a virtual card as an example- because many clients were purchasing online, they started trying those sorts of services, and we have seen growth"*. IE5 agreed that *"social distancing forced us to start transacting digitally"*. In support, FE2 added that *"customers started adopting more digital features, more digital channels. We got our customers using apps to all-time highs"*. This agrees with the claim by Chen et al. (2022) and FSB (2022) that the COVID-19 pandemic has accelerated the adoption of financial technologies and consumers' digital footprints have grown dramatically as more activities moved online.

In conclusion, industry experts unanimously agree that the COVID-19 pandemic led to significant changes, one of which being the rapid adoption of financial technologies. FE6 succinctly put it this way: "*The COVID-19 pandemic has changed the landscape. Fintech growth in the last two years has been tremendous. If you look at the number of new consumers using our fintech. It is a six-digit number. Every month more people are using fintech"*.

4.4. QUANTITATIVE FINDINGS

To enhance and validate the results obtained from the interviews, a questionnaire-based triangulation approach was adopted. For this purpose, twenty-two industry experts from fintechs, regulatory, and incumbent financial institutions were selected, all of whom held managerial positions. These experts were distinct from those who conducted the interviews. They were asked to rate a set of statements using a Likert scale ranging from strongly disagreed to strongly agreed. The results are further elaborated below.

4.4.1. Descriptive statistics

A total of twenty-two individuals with expertise in the industry participated. Among them, fourteen were female and eight were male. Two of the respondents work for fintech companies, four for regulatory institutions, and sixteen for traditional banks. Thirteen of the respondents

have over ten years of experience in financial services, while one has seven to ten years, four have four to six years, two have one to three years, and two have less than one year of experience. This suggests that most of the respondents possessed extensive knowledge about the changes occurring in the financial services industry due to their considerable experience.

4.4.2. Frequencies

The frequency graphs below indicate how often each observation occurred in the data.

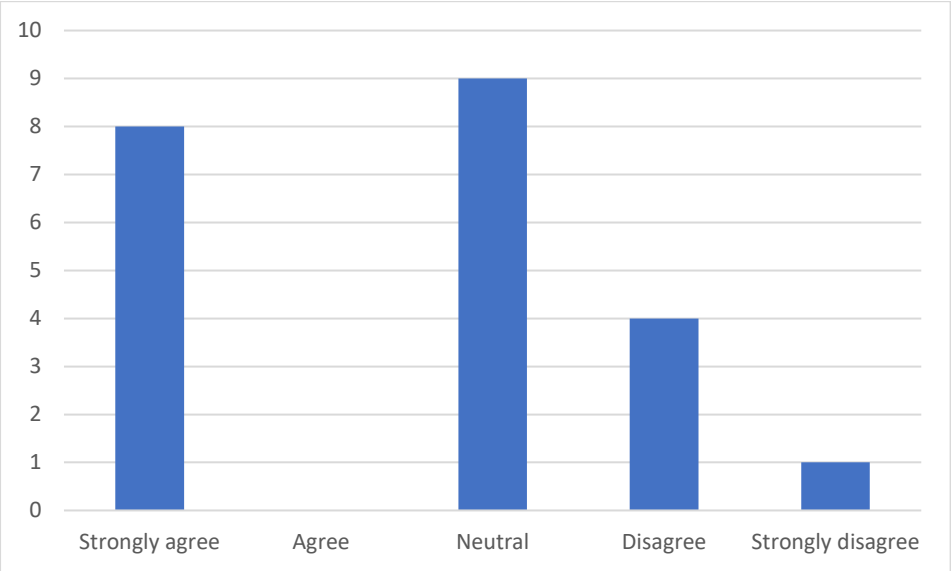


Figure 4-1 Fintechs are having a positive impact on the financial services industry

Figure 4-1 shows that eight (40%) of respondents believe fintechs have a positive impact on the financial services industry, while five (23%) believe fintechs have a negative impact. This is consistent with the findings of the interviews, which showed that fintechs benefit the industry by making the industry more competitive, introducing new products and services, increasing market speed, and improving financial inclusion.

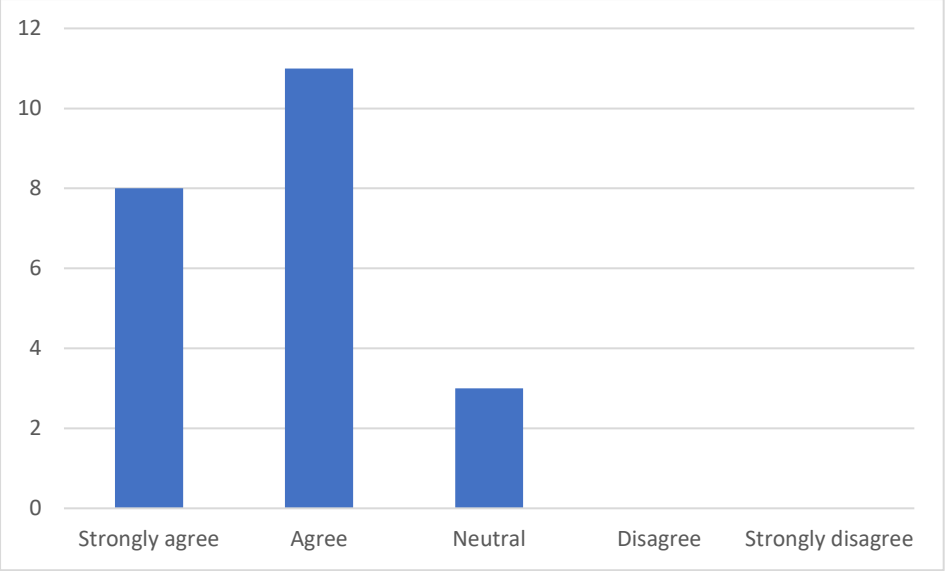


Figure 4-2 Fintechs present the financial services industry with new growth opportunities

Figure 4-2 confirms the findings from the interviews that fintechs bring new growth opportunities in the industry, with more that eighty-five percent of the respondents confirming this. This corroborates findings from the interviews. For example, industry experts interviewed argued that fintechs provide more opportunities for growth because they extend the delivery of financial services to previously excluded consumers.

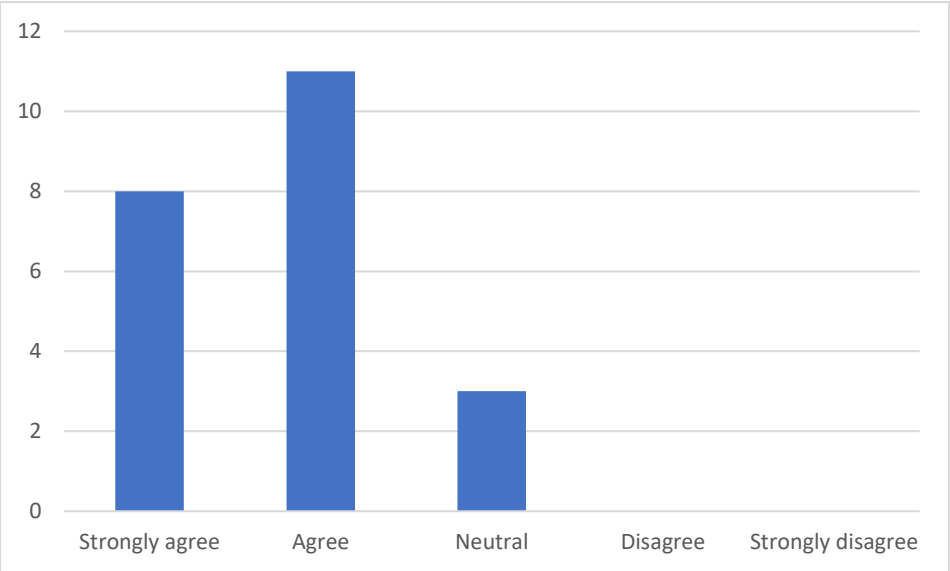


Figure 4-3 Fintechs bring benefits to the customers in the financial services industry

Figure 4-3 shows that more than eighty-five percent of respondents agree that fintechs provide benefits to customers. This supports the qualitative findings where IE2 and IE4 argued that fintechs focus on customer pain points and solve their problems by making financial products more affordable, improving efficiency, improving client experience, and increasing financial inclusion.

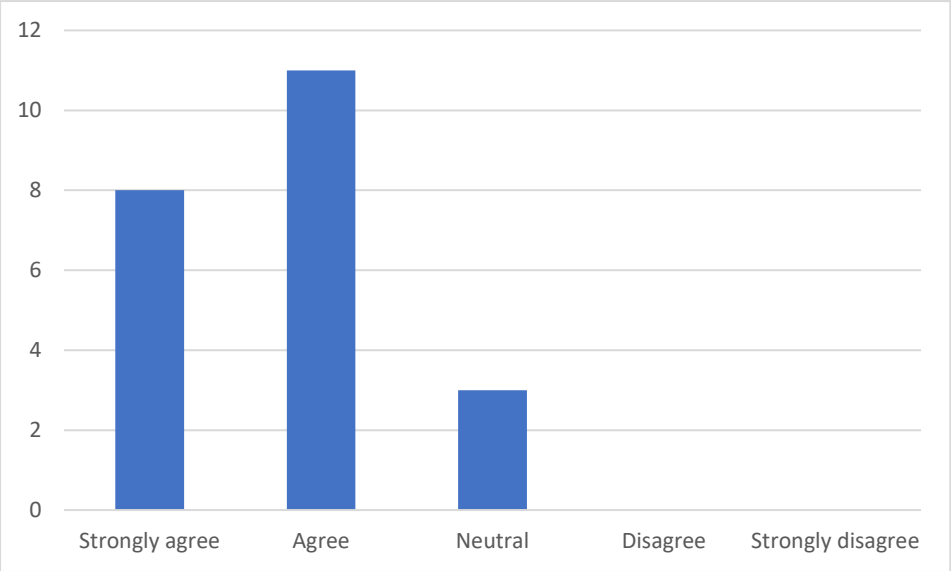


Figure 4-4 My organisation is responding adequately to the fintechs disruption

Figure 4-4 shows that more than eighty-five percent of the respondent are confident that their organisations are responding adequately to the disruption by fintechs. This reaffirms the findings of the interviews, in which industry experts argued that their organisations are responding to the disruption caused by fintechs by partnering with fintechs, changing their roles, upskilling their employees to prepare them for industry change, improving customer experience, lowering the costs of financial products and services, copying fintechs, and acquiring fintechs.

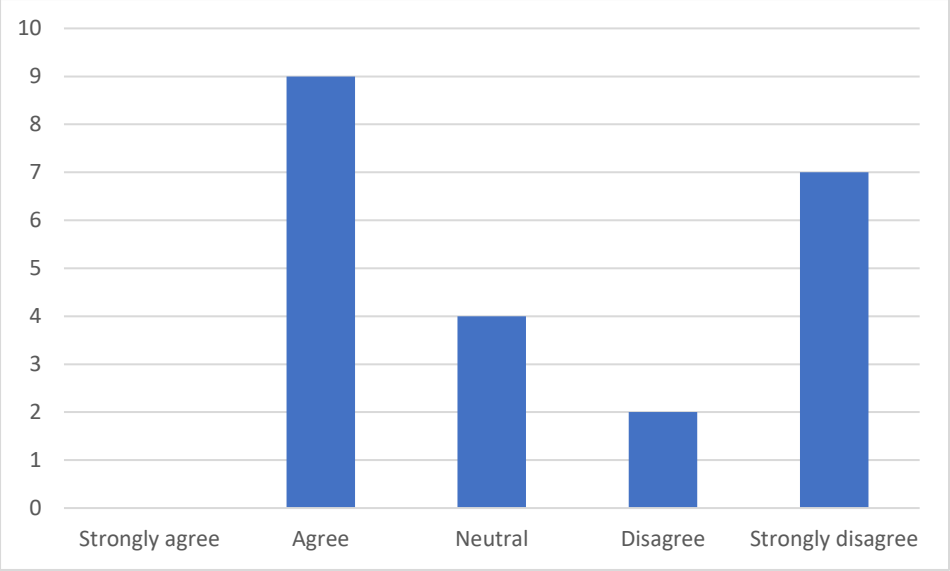


Figure 4-5 Regulatory is doing enough to regulate fintechs and ensure consumer safety from things like cybercrimes

In Figure 4-5 more than forty percent of the respondents confirmed that the regulators are doing enough to regulate fintechs while forty percent believe regulators are not doing enough. These findings corroborate the findings of the interviews, in which industry experts stated that there is a gap in regulating fintechs even though regulators have expanded regulatory oversight by launching regulatory extensions such as IFWG, PIB, RPP, regulatory sandboxes, and the innovation hub to ensure that fintechs are included in the regulatory framework.

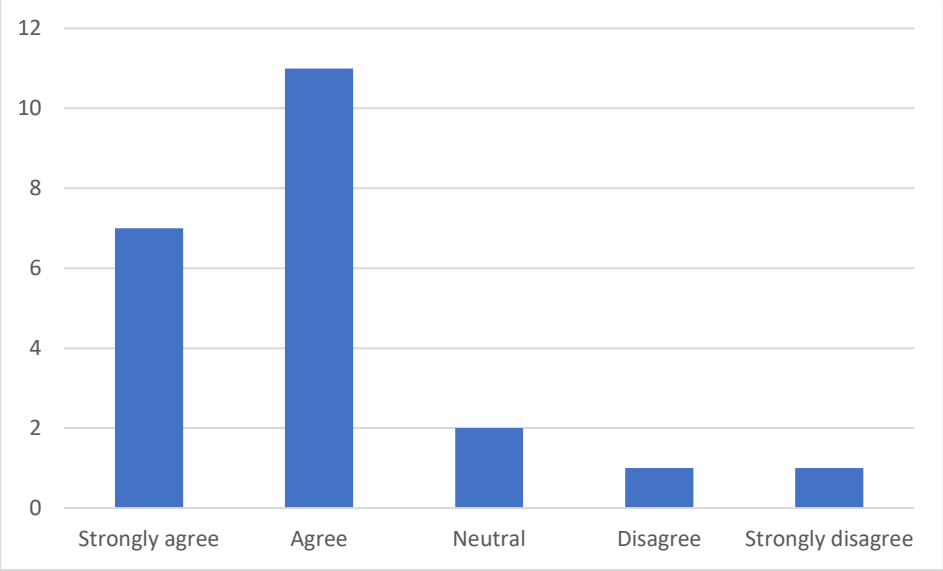


Figure 4-6 COVID-19 has fast-tracked the adoption of the fintechs

Figure 4-6 displays that more than eighty percent of the participants contend that the COVID-19 pandemic has accelerated the adoption of fintech. This is consistent with the findings of the interviews, which conclusively argued that the COVID-19 pandemic changed the landscape and forced financial services institutions to accelerate the launch of financial technologies that would have taken many years to develop under normal conditions, as well as consumers to adopt. In agreement, FSB (2022:2) argued: "While the ability of digital innovation to improve market access, the range of product offerings, and convenience has been acknowledged for some time, pandemic-related responses and containment measures increased the importance of these factors".

4.4.3. Reliability

Reliability analysis was done to determine the reliability of the questionnaire. The Cronbach's Alpha of the research instrument was 0.767. This value is close to one therefore, the research instrument was highly reliable, and the items in the test were highly correlated.

To sum up, the quantitative data align with the insights gathered from interviews with industry experts, indicating that fintechs impact the financial services industry positively and negatively. Incumbents experience both favourable and unfavourable outcomes, while regulations suffer a negative impact, and consumers benefit from fintechs. The respondents unanimously agree that

incumbents have effective strategies to manage fintechs' impact. The experts noted that financial services regulators acknowledge the risks and regulatory ambiguity fintechs pose to the industry, prompting the development of adequate measures to counteract their negative impact.

FOCUS AREA 2 FINDINGS: ADOPTION OF FINTECHS BY CONSUMERS IN SOUTH AFRICA

4.5. INTRODUCTION

This section presents findings addressing the research question:

- What are the factors that influence customers to use fintechs (like a digital-only bank) in South Africa?

The data collected through interviews were analysed using Atlas.ti 22 and thematic analysis, and the resulting themes will be presented below. These themes served as the foundation for developing hypotheses for the quantitative portion of the second focus area of the study.

The following sections will present the qualitative findings first, followed by the quantitative findings.

4.6. DEMOGRAPHICS OF THE PARTICIPANTS

Seventeen banked individuals (customers of financial services) who held at least one bank account with a financial institution in South Africa, as well as eighteen industry experts were interviewed to gather their perspectives on the factors that drive customers to adopt fintechs.

4.7. QUALITATIVE FINDINGS

Despite the advancements in financial technologies and the significant investments put into them, there are concerns about the challenges in their adoption, especially in developing countries. Several studies (Zhou, Lu and Wang, 2010; Yu, 2012; Gunawan, Sinaga and WP, 2019) have highlighted this issue. In South Africa, poor adoption of financial technologies can be attributed to various challenges that are rooted in the country's history and infrastructure. As explained in chapter 2, the financial services industry in South Africa has evolved significantly over the years, given the country's transition from the apartheid regime to the democratic government administration (Mckenzie et al., 2015). Secondly, the country's economy can be described as having two components, with modern and sophisticated infrastructure in the traditionally suburban areas, including electricity, telecommunications, banking, and retailing. On the other hand, the townships, informal settlements, and rural areas, characterised by poor infrastructure, have limited access to sophisticated services, such as

technology, telecommunications, retailing, and banking services (Klemz, Boshoff and Mazibuko, 2006).

The interviewees corroborated the above and FE3 contended: *"SA is unique in that it has its challenges"*. Consequently, IE6 argued: *"the neo banks will snag some customers. I imagine my children who are tech natives who were born into this thing will opt to bank with a neo bank (digital-only bank) but my generation and the generations before, I think will stick with the traditional things"*. FE3 agreed and argued that *"high adoption is definitely among the youth, but not so much among the older generation"*. This is consistent with the arguments of Pedro Palandrani (2019) and Nejad (2022) who contended that the adoption of fintechs is high amongst the millennials and the Gen Z generations who have become technology natives.

The question then is what are the factors that influence customers to use fintechs in South Africa? Research findings answering this question were analysed and grouped in four themes:

- Theme 1: Facilitating conditions and perceived cost.
- Theme 2: Ubiquity and convenience.
- Theme 3: Awareness, education, and self-efficacy.
- Theme 4: Perceived risk and perceived trust.

4.7.1. Theme 1: Facilitating conditions and perceived cost

Facilitating conditions are crucial in determining fintech adoption, in accordance with Asnakew (2020). These conditions refer to environmental factors that increase an individual's likelihood of using technology and their belief in the availability of technical infrastructure necessary for accessing fintech services (Venkatesh et al., 2003). Meanwhile, the perceived cost of using fintech is a significant factor in customer adoption, as noted by Huei et al. (2018). This cost may include expenses related to acquiring a compatible device and costs associated with data or airtime required to download and utilise relevant applications (Al-Saedi et al., 2020).

The interviewees emphasised the significance of these components.IE5 argued: *"What will probably hold back fintechs for now, especially in a country like South Africa is that half the country is poor and is rural…That part of the population tends to be more reluctant to use digital services and they are less tech savvy"*.

IE1 added that "*like any other country, South Africa has a combination of people who are digital natives and those who adapt later. In terms of absolute numbers, we have a far smaller number that is ready for some of the fintech"*. EI4 agreed: *"I am not certain that the majority of South Africans are ready to deal with a completely online bank. We do see still some clients who wish to go to a branch to talk to a person about a complex transaction. While I say that, I do think there is a lot more openness to technology-based financial services, but I do not know if consumers are ready for the extreme, which is you do not ever speak to a human. All you do is go online and get your service. I am not certain that we are there just yet. I think early adopters would be. However, I think there is still quite a significant number of South Africans who may not be... I mean, in some rural areas, there is no electricity. There is no internet. So, a fintech would struggle to touch them, just because the infrastructure is not yet there at that time"*. In agreement, Customer 1 (C1) contended that *"challenges like access to smart phones still makes it difficult to use fintechs. If the financial institutions can make it easy to transact and enable people to use basic phones other than smart phones more people will adopt fintechs"*. *"*In congruence, C13 argued that *"access to technology is a serious issue. Many people are still without access to technology, and this makes it difficult to use these services"*.

IE1 added: *"I think for people who have limited access to tech devices, access to Wi-Fi or affording data, I think it's still a bit far"*. FE4 concurred: *"access to data is not any better"*. C4 argued that *"data are so expensive; people just do not have access to that all the time"*. In tandem C12 posited: *"access to data, access to smartphones and computers prevent people from using fintechs"*. C9 argued that *"few people have access to smartphones or laptops. Even those who have smartphones are not keen to adopt due to several reasons like fear of scams"*. FE3 agreed and added that *"as long as our data prices stay where they are, which is actually quite expensive, adoption is going to remain low"*. FE3 partitioned: "*Even though we have a lot of handsets out there, I think the percentage of the population that actively use apps on their phone is actually smaller than we think"*. C5 agreed: *"Everyone that is using internet banking, vast majority through their cell phone devices have access to the internet, but vast majority of those people, including myself are hesitant in using these online transactions"*. In addition, FE5 contended: "*You probably have to ask yourself how many of people in rural areas actually have access to phones and actually understands features of the smartphones"*.

To increase adoption, financial institutions should find ways to assist people in accessing fintechs. C9 proposed that: *"the financial institutions should incentivise people to use fintechs"*. C12 agreed and suggested that financial institutions: *"should make the apps not to charge data"*. This would encourage more people to adopt fintechs. Some financial institutions have already started incentivising customers for using their platforms. For example, C1 stated: *"Discovery (Bank) rewards you when you swipe (your bank card) more"*. IE2 also agreed and said that *"with Mymo (a Standard bank account) you get data and airtime every time you swipe your card…So, they are saying you will earn data and airtime because it allows you to bank"*. In addition, FE2 and FE4 confirmed that their organisations *"have zero-rated usage of the (banking) apps"*. These findings corroborate findings from the literature review. Hwang and Christensen (2008) reported that customers demand financial services at lower costs. Therefore, in agreement, Al-Saedi et al. (2020) argued that perceived cost has a negative effect on consumers intention to adopt fintechs.

To increase adoption, IE3 advised: *"there's an opportunity for banks to go into partnership with telecoms and put signals in rural areas and give everyone (who opens a bank account) a basic phone and give them free data"*. In tandem, IE2 added that *"if you make it simple and give me a smart phone, then I will be able to use fintechs"*. IE9 agreed: *"As long as the infrastructure is there, and the network is available, that is really a very good way to be able to get your products and your services to many people who previously did not have access"*. These findings were consistent with those of Deb and Agrawal (2017) and (Patil et al., 2020) who discovered that facilitating conditions were some of the most significant barriers to mobile banking adoption. They also agree with Halili and Sulaiman (2019) findings that the most influential construct for technology adoption is facilitating conditions. As a result, fintechs should expand or improve their infrastructure so that more customers can use fintechs.

4.7.2. Theme 2: Ubiquity and convenience

In accordance with the study, consumers are motivated to use fintechs due to their convenience and ubiquity. This ubiquity allows users to access financial services anytime and anywhere (Cao and Niu, 2019). In the past, people had to go to the bank for any bank-related activity but now because of fintechs *"financial services are delivered through your handset"* (EI7) and *"you don't have to go to the bank to do financial transaction"* (IE3). IE6 argued: *"The*

emergence of the fintechs has provided convenience". RE2 concurred: *"The bottom line is fintechs are offering consumers convenience"*. C5 argued that *"people in rural areas and other remote areas adopt fintechs because of convenience it brings to them"*. This is consistent with the findings of Cao and Niu (2019). These authors found that ubiquity has a significant positive influence on the adoption of fintechs. The study by Sarkar, Chauhan and Khare (2020) also found that ubiquity is a key factor that influences consumers to adopt fintech. As consumers are getting used to these benefits of fintechs, they have started demanding more convenience (Yanagawa, 2018), and ubiquitous financial services and products (Hwang and Christensen, 2008).

4.7.3. Theme 3: Awareness, education, and self-efficacy

Lack of awareness and understanding of the benefits of fintechs are amongst the key barriers to adoption of fintechs (Laforet and Li, 2005). In agreement, respondents believe that lack of awareness and lack of education about fintechs is one of the biggest hinderances in adoption in South Africa. Education and knowledge are important determiners of self-efficacy (Gist and Mitchell, 1992) which is defined as an individual's personal assessment of his or her ability and skills to succeed when using a fintech (Shin, 2009; Chao, 2019). Therefore, lack of education affects self-efficacy negatively. IE6 contended: *"I think the masses in South Africa are not exposed to these things"*. C6 argued: *"From the top of my head I can say maybe lack of education and security are the challenges to adoption"*. C9 posited "*an average South African is not educated enough."* C7 agreed and stated: *"not everyone is well informed"*. In congruence, C5 argued that *"the biggest hurdle is lack of education. So, the obvious would be, banks should educate more"*. In tandem C16 added: *"It is all about education. The more you see something, the more you want to use it"*.

The industry experts agreed that the financial institutions need to assist the customers through the adoption journey. *"We (financial institutions) have to do quite a bit of work to transform the behaviour of clients…we need to then invest additional effort in educating clients"* (IE4). In agreement, RE2 stated that *"customers must be educated. That is very important. They are partaking in this product, but they are not educated, and they are making mistakes. And we are seeing this with Bitcoins. You can see consumers they are eager for these things, but they are not educated"*. C4 contended that *"I am saying that I would like it if they could offer more*

awareness, and more education. I do not think that is being offered to consumers now". C16 suggested: *"Edutainment is the key to enlighten people because it creates product interactions with customers,"* while C13 added: *"I think education in the form of workshops could help eliminate our fears around online banking"*.

IE8 advocated that *"we need as much investment in people that can help people on that journey"*. Furthermore, IE2 contended: *"you need human touch"*. C11 agreed: *"People prefer transacting the old way because they prefer dealing with human beings rather than machines. They do not trust the machines"*. *"People also want to touch and feel. Some people, especially older get a satisfaction when they hold their money in their hands and make physical payments,"* argued C12. The preceding arguments confirmed that customers need people who will teach them how to use these technologies. FE2 argued: *"Tymebank ambassadors at Pick 'n Pay, and Boxer stores play massively important role, because they can have a dialogue with customers.* C2 agreed with this approach: *"Tymebank had a good marketing strategy to go to Pick 'n Pay to educate customers"*.

In addition, FE3 argued: *"We believe that if you are playing in the digital space, you need to create awareness in the digital space as well. So, we have got some huge efforts going on to build informative videos on YouTube, on Tik Tok, Facebook, do blogs, all those kinds of things…While we use some traditional platforms like newspapers and magazines, they are not our prime focus for creating awareness. We try and use the digital platforms as much as possible to emphasise that we are a digital player as opposed to a traditional player"*. Contrary, C4 does not believe that fintechs should focus their attention on online advertising only. *"Not everybody is listening on those online platforms and if that is the people, they want to talk to them, they are going to miss the rest of the consumer market"*, claimed C4. C1 believe that Discovery Bank made a mistake by only advertising online when they started as he argued: *"Discovery bank was for people who are online. If you are not constant on online, you would not necessarily interact with them"*. C1 added: *"It is about information. I mean, there's billboards around about Luno (a cryptocurrency platform). These billboards have played a huge role in creating awareness about Luno"*. As a result, fintechs should think beyond simply advertising their services online. If they want to reach a large population to raise awareness and educate them, they should consider other advertising platforms.

4.7.4. Theme 4: Perceived risk and perceived trust

According to the study, the adoption of fintechs in South Africa is influenced by perceived risk and perceived trust. Perceived risk refers to an individual's belief in the possibility of negative consequences when using such services (Khedmatgozar and Shahnazi, 2018), whereas perceived trust is the extent to which an individual believes fintech is reliable and safe to use (Al-Saedi et al., 2020). When it comes to adoption of a technology there is also an element of initial trust which plays a vital role. "Initial trust represents the trust that develops upon first use of a product. It is built based on the net effect of factors that stimulate as well as inhibit it. Future transactions require less consumer effort after initial-trust formation" (Talwar et al., 2020:1).

Many consumers are hesitant to adopt fintechs due to concerns about criminal activities and security. Interviewees noted that traditional financial institutions have established a good reputation over time, which has earned consumer trust. If something goes wrong during a transaction with a traditional institution, consumers know where to turn for help. However, fintechs lack physical branches, leaving consumers with low levels of trust and limited options for assistance if something goes awry. These findings corroborate the arguments of Laforet and Li (2005), Amin et al. (2008) and (Shin, 2009) that lack of credibility, trust, and security, are amongst the key barriers to adoption of fintechs. C15 contended that *"safety and security are the biggest issues. Fintechs do not award people the confidence that their money is safe. If something goes wrong banks wash their hands"*. C1 argued: *"Many people have lost money in things like Bitcoin scams, and they could not go to anyone for a recourse…I am also not comfortable. I am worried about fraud, and I do not trust fintechs 100 percent"*. In agreement, C13 claimed: *"Most people are not using these platforms because they fear being scammed, or making an error, resulting in the payment going to the wrong person. Just recently, I made a payment using FNB app. Three times in different occasions and on all occasions, it never gave me an OTP (One Time Pin) number. I was forced to go to the bank in every one of those situations. Also, there is an issue of trust"*.

C2 emphasised the issue of trust and fraud: *"The adoption is slow with fintechs because it is the money involved. There have been scams around there, so trust is something that needs to be dealt with"*. C7 reiterated: *People are afraid of using any form of online payment due to*

scams. Safety and security are the biggest issues". C6 agreed: *"Security reasons are a serious challenge"*. C16 also mentioned the issue of security: *"It is about security-related issues. People want to feel that they are transacting safely and that no one will have access to their information"*. C12 contended that *"people are sceptical of technologies that do not involve human touch"*. C17 also argued that *"the prevalence of cyber fraud is the biggest concern for people. The fact that one could lose a substantial amount of money due to cyber fraud is the biggest challenge"*. In tandem, C11 added that *"people don't trust fintech that much"*. C5 added: *"I would say, many people still believe in traditional ways of doing financial transactions. Lack of trust in virtual or electronic or online transactions still occupies a lot of people's minds unless it is facilitated by a trusted institution like a (traditional) bank"*.

C3 suggested that *"financial institutions need to at least meet some minimum standards and assure the consumers that the apps are secure"*. C4 agreed and proposed that the financial institutions need *"to find safer security measures. Like linking your fingerprints to your app, and when you are making a payment, use your fingerprints, as opposed to entering your account details. This site I used this morning required my PIN. And that made me feel so unsafe"*. To sum it up, RE3 added: *If safety, stability, reliability, and security are part of the package, then I think consumers will be quite happy to make use of the services provided by the fintech"*. These findings are consistent with the findings of previous studies such as Tang, Ooi and Chong (2020) and Ali et al. (2021) in which perceived risk was found to be key a factor hindering the intention to use fintechs. The findings also corroborate the findings of Liébana-Cabanillas et al. (2020) that perceived trust significantly influences the intention to use fintechs.

4.8. QUANTITATIVE FINDINGS

As shown by the qualitative findings, facilitating condition, perceived cost, perceived risk, perceived trust, ubiquity, awareness, education, and self-efficacy are key constructs in the adoption of fintech in South Africa. These constructs were used as the basis for the quantitative study which was used for triangulation and to develop the fintechs adoption framework for South Africa. Six more constructs were added to develop the twelve-constructs questionnaire. The additional six constructs were social influence, effort expectancy, performance expectancy, perceived ease of use, and perceived usefulness. These constructs were added

because of the role they play in fintech adoption as explained in Table 4.3 below. A minimum of three questions were derived from each construct. Likert scale was used to complete the questionnaire in which the respondents were asked to rate each statement according to whether they strongly agree, agree, neutral, disagree or strongly disagree with each statement. SPSS 28 and Amos 27 were used for data analysis and model development.

Table 4-3 Constructs and the sources

Constructs	Meaning	Source
Self-efficacy	The confidence an individual has in their own ability and skills to succeed when using a technology.	Chao (2019); Shin (2009)
Perceived cost/value	The extent of one's expectation to bear expenses for using a particular technology.	Huei, Chenh, Seong, Khin and Bin (2018)
Social influence	The extent to which others in one's social environment, such as family, colleagues, and friends, and their beliefs in using a particular technology.	Dečman (2015)
Performance expectancy	The multiple advantages and features that can be gained by utilising technology.	Venkatesh et al. (2003)
Perceived usefulness	An individual's confidence in how using technology can improve their performance.	Davis (1989)
Perceived ease of use	The degree to which a person believes that using a technology would be free of effort.	Davis (1989)
Effort expectancy	The degree of ease associated with the use of a technology.	Venkatesh et al. (2003)
Facilitating conditions	The degree to which an individual believes that (technical) infrastructure exists to enable him or her to use a technology.	Venkatesh et al. (2003)
Ubiquity	The extent to which an individual perceives that using a technology would require minimal effort.	Cao and Niu (2019)
Hedonic motivation	The extent to which an individual enjoys or finds pleasure in using a technology.	Venkatesh et al. (2012)
Perceived risk	An individual's perception and confidence in the possibility of experiencing negative outcomes and consequences when using technology.	Khedmatgozar and Shahnazi (2018)
Perceived trust	The level of trust an individual has in the reliability and safety of a technology.	Al-Saedi, Al-Emran, Ramayah and Abushamet (2020)

Hypotheses formulation

Six hypotheses were formulated for the purposes of developing the fintech adoption framework using themes from the qualitative findings. Awareness and education were grouped under self-efficacy in the hypotheses formulation because they are regarded as its determinants (Gist and Mitchell, 1992). The following hypotheses were proposed:

The emergence of fintechs has brought both positive and negative impacts on consumers in financial services. A major drawback of digital transactions is the potential exposure to cybercrime, with cybercriminals stealing consumers' credentials when they use fintechs. Therefore, Coetzee (2018) recommends that regulators prioritise cybersecurity and client data protection in their regulatory measures. Due to concerns about online fraud and cybercrime, many consumers are hesitant to engage in digital transactions. Pursuant to Ali et al. (2021), the perceived risk associated with fintech adoption has a negative impact. Consequently, the following hypothesis was formulated:

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

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

The financial services industry has greatly benefitted from the emergence of fintechs, as they have enabled the provision of financial services and products at reduced costs. This has made these services accessible to individuals who were previously excluded. However, the expenses associated with using fintechs, such as airtime or data costs for digital transactions, have deterred many consumers from utilizing them (Humbani and Wiese, 2019). As a result, financial institutions should prioritize reducing transaction costs to promote wider adoption of fintechs among consumers. The formulated hypothesis is:

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

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

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

In the past, physical branches were the only way to access financial services, which caused inconvenience for consumers. They had to wait for the branches to open to conduct transactions like sending money. Fortunately, fintech companies have revolutionised this industry by providing more accessible and convenient financial services and products (CFA Institute Asia-Pacific Research Exchange, 2017). With fintechs, one can now access financial services beyond regular banking hours and without going to a physical branch. This has greatly benefited consumers who appreciate the convenience. As a result, Yanagawa (2018) suggests that consumers have grown accustomed to this convenience and now demand even more ubiquitous financial services. Hence, the following hypothesis was developed:

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

Although fintechs offer many benefits to consumers, their usage depends on the availability of technical infrastructure that enables consumers to access them. This infrastructure includes mobile devices, airtime, data, and quality mobile networks, which are referred to as facilitating conditions. Without these conditions, consumers cannot adopt or use fintechs. As stated in Venkatesh et al. (2003), facilitating conditions are crucial in the adoption of fintechs. Considering this, the following hypothesis was proposed:

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

According to Singh, Sahni and Kovid (2020) security is more crucial when using fintech compared to traditional financial institutions. This is because digital transactions make consumers' credentials more vulnerable to cyber fraud than in-person transactions.

Consequently, the lack of trust in digital transactions discourages consumers from adopting fintech. This lack of trust could stem from various factors, including the unfamiliarity of most consumers with fintech companies compared to traditional financial institutions like banks. Therefore, the reputation of a financial service institution is vital in determining whether a consumer can use fintech. Based on this research, the following hypothesis was developed:

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

4.8.1. Descriptive statistics

Although Structural Equation Modeling (SEM) typically requires a large sample size, research has shown that SEM models can be meaningfully tested even with a small sample size. Tinsley and Tinsley (1987) argue that a minimum sample size between 100 and 150 is considered adequate for conducting SEM. This is also supported by Wolf et al. (2013). For this study, one hundred and twenty (120) customers completed the questionnaire. Out of one hundred and twenty responses received one was incomplete, hence one hundred and nineteen were used for data analysis. Out of the one hundred and nineteen respondents, sixty-seven (56.3%) were male, forty-nine were female (41.2%), two (1.7%) preferred not to provide their gender and one (0.8%) did not choose any option. Ninety-one (76.5%) respondents have used or use a financial technology, twenty-seven (22.7%) do not use fintech, and one (0.8%) did not respond. More than 50 percent of the respondents use more than one financial technology (53.8%), 48.7 percent use mobile payments which is incidentally the most used financial technology worldwide (de Luna et al., 2019), 23.8 percent use digital-only banks, 20.2 percent use banking apps, 10.9 percent use cryptocurrency, 1.7 percent use the landing platforms and 0.84 percent use crowdlending.

4.8.2. Reliability

Reliability analysis was done to determine the internal consistency of the factors. The Cronbach's Alpha of all the constructs (self-efficacy: 0.819, perceived cost: 0.724, social influence: 0.486, performance expectancy: 0.854, perceived usefulness: 0.877, perceived ease of use: 0.815, effort expectancy: 0.893, facilitating conditions: 0.738, ubiquity: 0.791, hedonic motivation: 0.900, perceived risk: 0.697 and perceived trust: 0.764) ranged from 0.486 to 0.900. Cronbach's Alpha of social influence (0.486) fell below the acceptable range of 0.7 and was deleted, as argued by Hair et al. (2010). Cronbach's Alpha of all other items fell within the

acceptable range of 0.70 to 0.95, as suggested by Tavakol and Dennick (2011). These values are close to one (1); therefore, the instrument was highly reliable and had high internal consistency. This is shown in Table 4-4.

Table 4-4 Reliability, means and standard deviations of the variables

Items Statistics	Cronbach's Alpha	Means	Standard Deviations
Self-efficacy	0.819	2.266	
SC1		2.160	1.487
SC2		2.050	1.315
SC3		2.110	1.299
SC4		2.300	1.487
Perceived cost/value:	0.724	2.217	
PC1		2.860	1.441
PC2		2.220	1.432
PC3		2.670	1.371
Performance expectancy	0.854	2.195	
PE1		1.920	0.953
PE2		1.860	0.933
PE3		2.420	1.469
PE4		2.580	1.493
Perceived usefulness	0.877	2.289	
PU1		2.330	1.456
PU2		1.920	0.966
PU3		2.340	1.486
PU4		2.290	1.415
PU5		2.010	0.983
PU6		2.530	1.376
PU7		2.620	1.365
Perceived ease of use	0.815	2.266	
PEU1		2.270	1.471
PEU2		2.300	1.458
PEU3		2.230	1.304
Effort expectancy	0.893	2.124	
EE1		2.130	1.375
EE2		2.100	1.323
EE3		2.140	1.360

Items Statistics	Cronbach's Alpha	Means	Standard Deviations
Facilitating conditions	0.738	2.171	
FC1		1.770	0.949
FC2		2.190	1.395
FC3		1.950	0.999
FC4		2.070	1.226
FC5		2.400	1.091
FC6		2.650	1.345
Ubiquity	0.791	2.274	
U1		2.320	1.424
U2		2.060	0.994
U3		2.440	1.488
Hedonic motivation	0.900	2.249	
HM1		2.360	1.136
HM2		2.170	1.193
HM3		2.220	1.141
Perceived risk	0.697	2.261	
PR1		2.170	1.206
PR2		2.400	1.146
PR3		2.250	1.184
PR4		2.270	1.223
PR5		2.470	1.223
PR6		2.010	1.246
Perceived trust	0.764	2.153	
PT1		2.110	1.173
PT2		1.940	1.365
PT3		1.950	0.967
PT4		2.500	1.083
PT5		2.470	1.123
PT6		1.910	1.223
PT7		2.180	1.194

4.8.3. Exploratory factor analysis

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are the two methods for determining factor unidimensionality (Mbama and Ezepue, 2018). EFA was used to investigate the underlying theories behind the phenomena. It was used to summarise the findings into smaller chunks by allocating them into distinct factors (Hair et al., 2010). CFA is used to evaluate the explanatory power of a factor model, to decide which model or models best represent the data and to measure instruments that have never been tested before hence does not include previously examined literature (Bryant, Yarnold and Michelson, 1999).

For this study, the value of Kaiser-Meyer-Olkin (KMO) was 0.692. This indicated a good factor analysis and sampling adequacy (Table 4-5), as stated by Tabachnick and Fidel (2019), who argue that the value of KMO must be at least 0.60. Bartlett's test of sphericity was found to be statistically significant with $p < 0.001$, which was less than 0.005. Therefore, it could be concluded that data and variables were correlated with each other and suitable for factor analysis.

Table 4-5 Kaiser-Meyer-Olkin and Bartlett's test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.692**
Bartlett's Test of Sphericity	Approx. Chi-Square	1020.409
	Df	325
	Sig.	<.001

The communalities ranged from 0.457 and 0.868 and averaged 0.707 (Table 4-6). This was within the acceptable range. Costello and Osborne (2005) argue that if an item has a communality of less than 0.4, it may not be related to the other items and should be deleted.

Table 4-6 Exploratory factor analysis communalities

Communalities

Construct		Initial	Extraction
Self-efficacy	Q1. I do not think I would have difficulties using a mobile device to bank digitally	1	0.725
	Q2. I would adopt digital banking if it had a built-in guide for assistance	1	0.703
	Q3. I would adopt digital banking if someone showed me how to use it	1	0.640
	Q4. I would use digital banking to do my banking transactions	1	0.749
Perceived cost	Q5. I will have financial barriers (e.g., purchase of a compatible phone, airtime, and data expenses) in order to use digital banking	1	0.655
	Q6. I would like to use digital banking if the banking fees are reasonable	1	0.672
	Q7. I believe I would have to put a lot of effort to obtain the information that would make me feel comfortable in adopting digital banking	1	0.681
Performance expectancy	Q16. Using a digital bank can make my banking convenient	1	0.834
	Q17. Using a digital bank can make my banking efficient	1	0.868
	Q18. Digital banking is (would be) useful in my daily banking	1	0.827
	Q19. Digital banking would help me do banking more quickly and save time so I can do other activities	1	0.726
Facilitating conditions	Q33. I have the resources necessary to use digital banking	1	0.709
	Q34. I have the knowledge necessary to use digital banking	1	0.734
	Q35. My mobile devices are compatible with digital banking	1	0.729
	Q36. I would like the digital banking platforms to suggest a customized path	1	0.630
Ubiquity	Q40. Banking transactions done digitally would eliminate time constraints that I otherwise would have when I visit a branch (i.e., I can bank anytime)	1	0.734
	Q41. Banking transactions done digitally would eliminate space constraints that I otherwise would have when I visit a branch (i.e., I can bank anywhere)	1	0.750

Perceived risk	Q45. Using digital banking is a potential risk	1	0.457
	Q46. I do not feel protected when providing personal information through a digital banking platform	1	0.709
	Q47. There is a high chance that something wrong would occur when using digital banking	1	0.613
	Q48. Conducting banking transactions on mobile devices is risky because one can easily lose or misplace the mobile device	1	0.586
	Q49. I fear that while I am making a transaction through digital banking, I might make mistakes since the correctness of the inputted information is difficult to check from the mobile phone screen	1	0.684
Perceived trust	Q52. I believe that I would get an immediate confirmation message when the transaction is completed.	1	0.803
	Q53. I expect digital banking to be reliable	1	0.579
	Q55. I have serious doubts that the banking transactions performed digitally will work satisfactorily	1	0.801
	Q56. The transactions done via digital banking are accurate	1	0.774

*Extraction Method: Principal Component Analysis.

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

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

Table 4-8 gives total variance explained. The table shows that variables 1 to 6 have eigenvalues of more than one. The total variance Table 4-8 below indicates that the first variable 8.707 was responsible for 33.490 percent of the total variance. The second variable (eigenvalue of 3.211) explained 12.352 percent, third variable (2.345) explained 9.020 percent, fourth variable (1.431) explained 5.502 percent, fifth variable (1.389) explained 5.344 percent and the sixth

variable (1.287) explained 4.950 percent of the total variance. Cumulatively these variables explained 70.658 percent of the total variance.

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

The discriminant validity was assessed using the Fornell and Larcker (1981) criterion, which compares the square root of each AVE in the diagonal with the correlation (off-diagonal) of each construct (Table 4-7). This table also shows that the Composite Reliabilities (CR) for all constructs are above 0.70, and the AVE values are between 0.5 (component 6 =0.472 rounded-off to 0.5) and 0.7. These results, therefore, support the discriminant validity.

Table 4-7 Composite reliability (CR), the square root of the average variance extracted (AVE) (in bold) and correlations between constructs (off-diagonal)

			Latent constructs					
	CR	**AVE**	**Component 1**	**Component 2**	**Component 3**	**Component 4**	**Component 5**	**Component 6**
Component 1	0.910	0.718	**0.847**					
Component 2	0.751	0.501	0.285	**0.729**				
Component 3	0.822	0.537	0.023	-0.055	**0.758**			
Component 4	0.694	0.531	0.376**	0.351**	0.301**	**0.729**		
Component 5	0.677	0.514	0.231*	0.206	0.169	0.156	**0.720**	
Component 6	0.641	0.472	0.269*	0.340**	0.081	0.323**	0.315**	**0.687**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 4-8 Total variance explained

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

Extraction Method: Principal Component Analysis.

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

4.8.4. Structural equation modeling

The SEM method was used to test hypotheses and investigate relationships between variables. Structural equation modeling enabled the researcher to test and draw relationships on the paths of the model. Amos 27 was used to perform a path analysis and test model hypotheses. A key step in structural equation modelling is determining the goodness of fit of the proposed model to the data (Shi, Lee and Mayday-Olivares, 2019). The most used model fit measures for SEM ($\chi 2/df$) =1.54 (the ratio of chi-square to degrees of freedom), p =0.00, CFI =0.885 (0.900)

(Comparative Fit Index), TLI =0.900 (Tucker–Lewis Index), and RMSEA =0.068 (Root Mean Square Error of Approximation) were used to test the goodness of fit of the model. A CFI ranging from 0.611 to 0.972 (Shi, Lee and Maydeu-Olivares, 2019) and an RMSEA less or equal to 0.06 are considered acceptable (Hu and Bentler, 1999).

Table 4-9 Model fit of fintech adoption in South Africa

Parameters	Overall fit of model value	Rounded off to the nearest hundredth
$\chi 2/df$	1.540	1.540
CFI	0.885	0.900
TLI	0.845	0.900
RMSEA	0.068	0.068

The path coefficient, or connection strength, represents the dependent variable's response to a unit change in an explanatory variable. A positive coefficient indicates that a unit increase in one variable causes a direct increase in the activity measure of the explanatory variable, whereas a negative coefficient indicates that an increase in one variable causes a direct, proportional decrease in the activity measure of an explanatory variable (McIntosh and Gonzalez-Lima, 1994). Figure 4-7 depicts the SEM of the factors as well as the path coefficients. This model indicates the following:

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

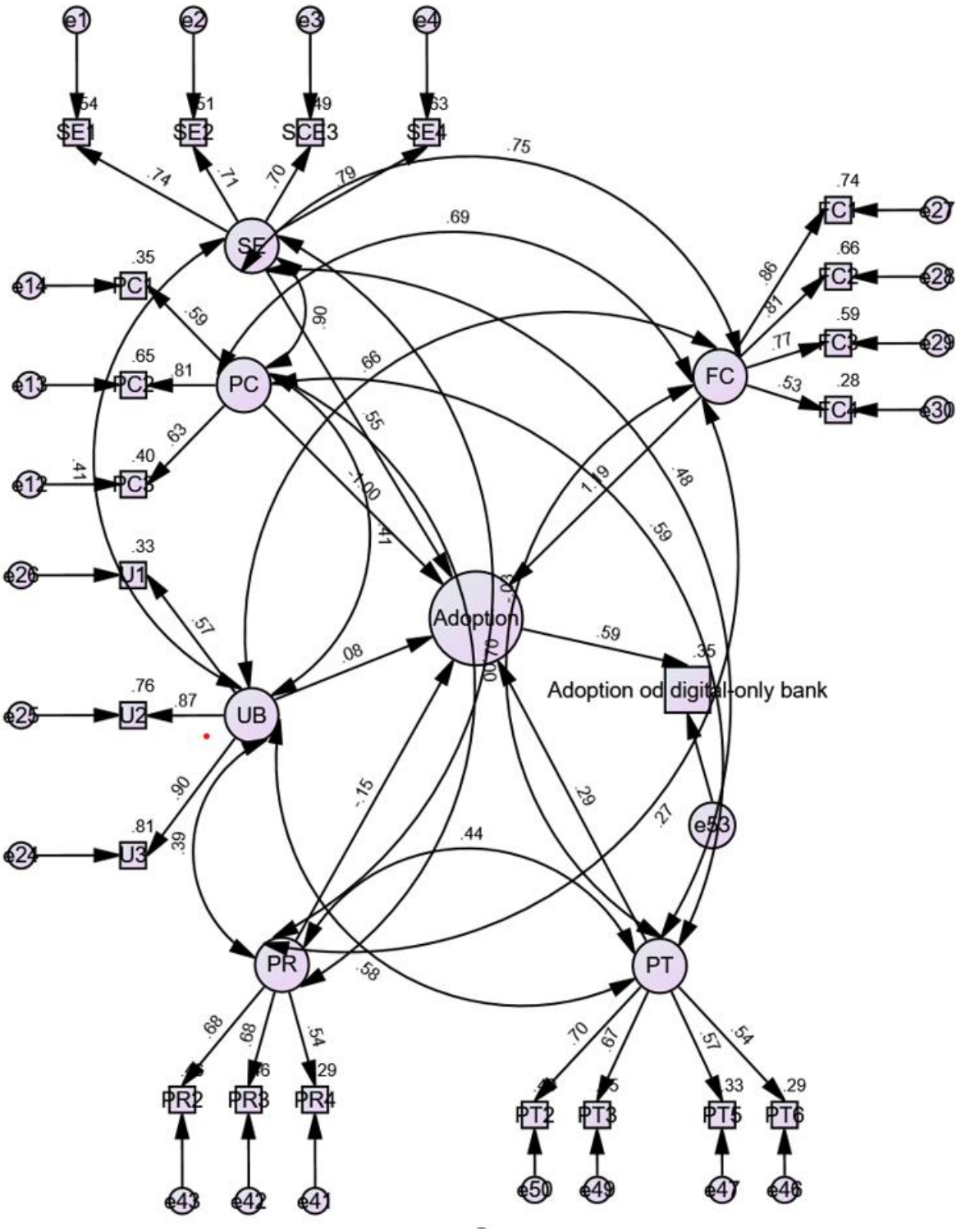


Figure 4-7 Model of the factors

Table 4-10 shows the path loadings for the SEM model fit. The table shows that there is a positive relationship between adoption and facilitating conditions, perceived trust, ubiquity, and self-efficacy. When these variables increase adoption also increases. It also shows that there is a negative relationship between adoption and the perceived cost and perceived risk. When these variables decrease, adoption increases. This corroborates the findings from the qualitative study. Facilitating conditions were found to be the most important determinants of fintechs adoption (when it goes up with one standard deviation, adoption goes up by 1,190 standard deviations) which agrees with the findings of Halili and Sulaiman's (2019), who identified the facilitating conditions as the most significant factors in promoting technology adoption. Ubiquity was found to be the less important determinant of all six constructs (when it goes up by one standard deviation, adoption goes up by 0.080 standard deviations).

Table 4-10 Hypotheses test for the SEM model

Hypotheses	**Relationship**	**Path coefficient**	**Remark**
H1	Perceived risk has a negative effect on the adoption of fintechs	-0.15	Accept
H2	Perceived cost has a negative effect on the adoption of fintechs	-1	Accept
H3	Self-efficacy has a positive effect on the adoption of fintechs	0.55	Accept
H4	Ubiquity has a positive effect on the adoption of fintechs	0.08	Accept
H5	Facilitating conditions have a positive effect on the adoption of fintechs	1.19	Accept
H6	Perceived trust has a positive effect on the adoption of fintechs	0.29	Accept

4.9. CONCLUSION

The first part of this chapter presented the findings of focus area one of this research. The section focused on the impact of fintechs in the financial services industry and the impact of COVID-19 on the adoption of fintechs. The chapter found that fintechs have positive and negative impacts on this industry. The positive impact includes financial inclusion, new growth opportunities, increasing choices for the consumers and making the industry more competitive, reducing costs for financial services and operational costs, customisation of financial services, convenience for the customers and forcing the incumbents and regulators to become more

innovative. The negative impact includes introducing new regulatory risks, increasing competition, reducing profits, and exposing the inability of the incumbents to be agile and act fast. In terms of response strategies, the incumbents are responding by partnering with the fintechs, expanding the bank's role, upskilling their staff so that they are ready for the industry changes, improving customer experience, copying the fintechs, acquiring the fintechs, and reducing the costs of financial products and services. In addition, the regulators are responding by expanding the scope of regulation.

The second part of the chapter presented the findings of focus area two of the research, which investigated the factors influencing consumers to adopt fintechs in South Africa. Factors that have a positive relationship with adoption are facilitating conditions, perceived trust, ubiquity, and self-efficacy. When these variables increase, adoption also increases. Factors with a negative relationship with adoption are perceived cost and perceived risk.

The next chapter will discuss the findings of the study and subsequently provide the frameworks developed from the findings.

CHAPTER 5: DISCUSSIONS

5.1. INTRODUCTION

The previous chapter presented the findings from the mixed methods research investigating this phenomenon. This chapter provides the interpretation of these findings according to the research questions. The chapter concludes with the development of the fintech adoption framework for South Africa and the framework that shows the impact of fintechs on the financial services industry in South Africa.

Fintechs have gained significant attention in academic and business circles, but their impact on emerging economies remains unclear (Cai, 2018; Nejad, 2022). Moreover, the adoption of these technologies by consumers in these economies needs to be improved (Sharma, Singh and Sharma, 2020). To address these gaps, this study explored the impact of fintechs on South Africa's financial services industry and the factors influencing consumers to adopt in the country.

Aim: This research aimed to investigate the disruptive impact of financial technologies on the financial services industry in South Africa, as well as to develop a framework for this impact and a framework for the adoption of financial technologies in South Africa.

Research questions:

1. What is the impact of fintechs on the financial services industry in South Africa?
2. How do traditional financial institutions and regulators respond to fintech disruptions in South Africa?
3. What are the factors that influence customers to use fintechs (such as a digital-only bank) in South Africa?
4. Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

5.2. INTERPRETATION OF FINDINGS

5.2.1. Research Question 1

This research question aimed to investigate the impact of fintechs in the financial services industry. In accordance with the research findings, fintechs are impacting the different stakeholders in the financial services industry in various ways and their impact on the financial services industry and its stakeholders has been both positive and negative. This is corroborated by the argument of Gomber, Koch and Siering (2017) that the impact of these technologies has been felt throughout the financial services industry. Fintechs are addressing customers' needs and enhancing the delivery of financial services and products. They lower prices, increase financial inclusion, offer customised services, improve customer experience, and make banking faster and more convenient by eliminating the constraints of time and location. Overall, fintechs are simplifying banking and increasing choices for customers.

Financial technology companies are instrumental in broadening access to financial services in untapped markets and stimulating economic growth. They also bring about positive changes in financial institutions by cutting down on operational expenses. For instance, fintechs eliminate the need for brick-and-mortar establishments, which come with numerous expenses. Additionally, they introduce greater agility to the industry and empower financial institutions to respond to market changes and customer demands quickly. This, in turn, enables financial institutions to provide services more efficiently.

The conclusions drawn align with the viewpoints of authors such as Museba, Ranganai and Gianfrate (2021) and Nejad (2022) who assert that fintechs have revolutionised financial services and significantly impacted customers' lives. The results also validate the claims made by Lenz (2016), Truong (2016), and Vasiljeva and Lukanova (2016) that fintechs introduce innovative business models, personalise financial products and services, and improve efficiency, accessibility, and transaction speed to offer customers personalised experiences. Additionally, the findings reinforce the arguments put forth by Lenz (2016) and Roszkowska (2021) that fintechs have created a more inclusive financial system with a diverse range of participants.

Contrary, fintechs are also introducing new challenges such as increasing competition and decreasing incumbents' profits and market share into the financial services industry. Further,

fintechs are introducing new risks such as cybercrimes, and other regulatory risks in the industry without any mitigation. Fintechs present regulatory challenges because they usually fall outside the traditional regulatory framework. These results corroborate the findings of authors such as Gomber, Koch and Siering (2017), Tsindeliani et al. (2022), and Nguyen, Tran and Ho (2021), who reported that fintechs pose a serious threat to incumbents by creating more competition and creating legal uncertainty because fintechs are not subject to the same regulations as incumbents.

5.2.2. Research Question 2

Another principal issue that needed to be investigated was whether the industry players such as regulators and the incumbents respond effectively to the disruption by the fintechs. The findings showed that the incumbents and the regulators have developed strategies that are helping them to respond to the disruptions by the fintechs and mitigate the negative impact thereof. According to the study findings these strategies include partnering with the fintechs, changing the bank's role, incumbents upskilling their staff so that they are ready for the fintech evolution, improving customer experience, reducing the costs of financial products and services, copying what fintechs do, and acquiring the fintech to leverage their expertise. This is consistent with the arguments of authors such as Lee and Shin (2018) and Acar and Çitak, (2019), who suggested that in response to fintechs disruption, incumbents should incorporate fintechs into their businesses, partner with fintechs, acquire fintechs, incubate and accelerate the growth of fintech startups.

The findings also showed that, in their response to fintechs, the South African regulators are intervening by expanding the scope of financial services legislation to include fintechs. These regulatory interventions include the establishment of regulatory sandboxes and fintechs task teams such as IFWG, RPP and Innovation Hub, whose objective is to provide regulatory guidance to the fintechs. Regulatory sandboxes allow fintechs to operate in a controlled environment while the regulator monitors them in their initial stages. This ensures that the regulator does not stifle innovation while ensuring that innovation does not introduce uncontrolled risk into the financial services industry. These results align with the assertions by Coetzee (2019) and Deloitte (2022) that regulators should broaden the regulatory framework and ensure it can accommodate new industry advancements. Additionally, they should create

a conducive environment that fosters innovation. Buckley, Arner and Barberis (2016) advocate for a more experimental and innovative regulatory approach towards fintech regulation. The interventions identified in this study align with the regulatory intervention strategies recommended by the International Monetary Fund (2019):

- Many jurisdictions are presently assessing the adequacy and flexibility of their financial services regulations to incorporate fintech innovations.
- Several governments, such as France, Luxembourg, and Switzerland, are working with private sector and industry experts to reform laws. Their aim is to introduce or announce amendments that will promote and support fintech industries in their countries by upholding legal principles.
- Several governments, such as Japan, China, and South Africa, have taken an active approach to collaborating with the private sector on fintech developments. They have launched proof-of-concept (POC) initiatives to thoroughly investigate the legal issues raised by these developments. Instead of passing laws, these governments have issued reports and research papers to educate industry players on legal risks and issues that require careful management.

5.2.3. Research Question 3

The purpose of this research question was to delve deep into the factors that influence customers to adopt fintechs in South Africa. This question also aimed to investigate the factors influencing consumers to use financial technology such as digital-only banks in South Africa.

The study shows that young people tend to adopt fintech more readily than older generations due to their greater familiarity with technology. This aligns with previous research that suggests younger consumers are generally more comfortable with technology (Palandrani, 2019; Nejad, 2022). However, the findings showed that fintech adoption in South Africa is low due to several challenges, including perceived costs associated with using fintechs, perceived risk, perceived trust and the lack of the enabling infrastructure - facilitating conditions- (e.g., data costs are inhibitory high).

The results indicated that South Africans do not trust the security of online transactions and doubt that digital platforms can provide hassle-free transaction experiences. Unlike traditional financial institutions that have established consumer trust over the years, fintechs are not trusted to the same extent. Consequently, consumers in South Africa are hesitant to embrace fintechs due to perceived trust issues. These findings align with the argument of Phonthanukitithaworn, Sellitto and Fong (2016) that the adoption of fintechs is influenced by perceived trust. When perceived trust increases, adoption increases, and vice versa. Singh, Sahni and Kovid (2020) also suggest that a lack of trust in digital transactions is a major barrier to adoption because security is more important when transacting digitally. One way for fintech institutions to address this challenge is by educating consumers and raising awareness about their services, which can help improve brand perception by customers and establish trust with potential customers.

According to the research, a lot of South African consumers are uneasy about conducting transactions through digital banking platforms due to concerns over online fraud and cybercrime. They are uncertain about things such as the security of the authentication processes used for verifying their identities. Consumers believe that their information can be accessed by cybercriminals when they carry out digital transactions. Some suggest that using fingerprints instead of passwords or PINs would be a more secure option. Most consumers feel that digital platforms do not meet the fundamental requirements necessary to ensure the safety and security of online transactions. This is partly because fintech companies, unlike traditional financial institutions, are not subject to strict regulations. Consumers worry that criminals can exploit regulatory loopholes created by fintechs and defraud them, as has happened in numerous cryptocurrency-related cases. The results are consistent with the findings of Ali et al. (2021) which suggest that the perceived risks associated with fintech adoption have a negative impact on people's willingness to use them.

To overcome these challenges, it is crucial for regulators to establish a consistent, comprehensive, and predictable framework that can effectively reduce the impact of perceived risks and encourage greater adoption (International Monetary Fund, 2019).

As is the case with many developing countries, South Africa is dealing with several infrastructure challenges. This study revealed that one of the biggest obstacles facing South

African consumers is the lack of necessary facilitating conditions, such as resources and infrastructure, required for fintech adoption. For example, many consumers in rural areas do not have access to electricity or stable telecommunication networks, which are essential for using digital devices. Additionally, a significant number of people do not own smartphones or other devices that would enable them to conduct digital transactions. These findings are in line with previous studies' findings indicating that facilitating conditions are critical factors in influencing adoption of fintechs (Venkatesh et al., 2003; Venkatesh, Thong and Xu, 2013). For fintech adoption to increase, it is important to have the necessary resources and infrastructure in place. Meeting these conditions can potentially encourage customers to adopt fintechs, as noted by Gupta and Xia (2018) and Gupta and Arora (2019).

The study also found that the excessive cost of mobile data and airtime is a huge barrier to adoption in South Africa, a developing country with one of the highest unemployment rates in the world at 32.9 percent in the first quarter of 2023 (Statistics South Africa, 2023), These costs have a significant impact on the feasibility of using such technologies. These findings are consistent with the findings of the studies done by Huei et al. (2018) and Rahi, Abd.Ghani and Hafaz Ngah (2019) which showed that perceived costs and lack of facilitating conditions have negative effects on the adoption of fintechs respectively.

The findings of the study highlight that inadequate adoption of fintech is also attributed to the lack of awareness and education. South African consumers perceive financial institutions as not doing enough to educate them on the functionalities and advantages of fintechs. This perception adversely affects their confidence in using fintechs as they believe they lack the necessary skills. However, consumers feel that with adequate awareness and education, they can learn about the benefits and risks associated with these technologies, increasing their self-efficacy and encouraging adoption. These findings align with the studies conducted by Rahi, Abd.Ghani and Hafaz Ngah (2019) and Al-Saedi et al. (2020), which emphasise the importance of self-efficacy as a vital factor influencing the adoption of fintechs. Therefore, financial services institutions should prioritise educating consumers and raising awareness about fintechs and their benefits to increase adoption.

On the bright side, this study showed that some South African consumers have recognised the convenience and ubiquity brought by the fintechs and as a result, they have started demanding services that provide these. The study revealed that these factors are especially significant in encouraging consumers to use fintechs. This is consistent with the findings from previous studies by Nikou and Economides (2017), Cao and Niu (2019) and Sarkar, Chauhan and Khare (2020) which demonstrated that convenience and ubiquity affect the adoption of fintechs positively.

The quantitative findings were consistent with the qualitative findings. They illustrated that when perceived cost and perceived risk rise, so does the intention to adopt fintechs. Therefore, to increase adoption, financial institutions should keep the costs of using fintechs low and ensure that fintech transactions are safe and secure. In contrast, when factors such as perceived trust, facilitating conditions, ubiquity (ubiquity was found to be the least essential determinant), and self-efficacy increase, so does the intention to adopt fintechs. This implies that financial institutions need to work on enhancing the way consumers perceive their brands to gain their trust. Once consumer trust is established, the adoption rate is likely to increase. Financial service providers should prioritise the provision of enabling infrastructure, like data, to enhance fintech adoption. This is because according to this study, facilitating conditions are the most significant determinant of fintech adoption. Moreover, these providers should increase their efforts in educating consumers about fintech usage. This will boost consumers' confidence in using fintechs, and thus, encourage adoption. Additionally, financial institutions should raise awareness and highlight the benefits of fintechs, such as convenience and the ability to transact anytime and anywhere. Various marketing interventions via different marketing channels can be employed to educate consumers and raise awareness about fintechs.

5.2.4. Research Question 4

In accordance with the study, fintech adoption in South Africa has been low, but the COVID-19 pandemic has played a significant role in speeding up its adoption. Financial service providers were able to quickly implement digital strategies that may have taken years to develop, thanks to the pandemic. As a result, consumers have also increased their overall adoption of fintech services.

During the period when individuals were confined to their homes, they turned to online platforms for purchasing goods and began utilising fintechs for their financial transactions. Due to the inability to physically visit banks, people started adopting fintechs such as digital banking. Additionally, financial institutions introduced more cashless options, such as tap-to-pay and QR code payments, to minimise the use of cash, which had been identified as a potential carrier of the virus. This is consistent with the findings of Shahabi et al. (2020) that as the virus spread rapidly and social distancing measures were implemented, consumers were compelled to switch to online banking over branch banking, leading to an acceleration in fintechs adoption.

5.3. DEVELOPMENT OF THE FRAMEWORKS

Chapter four of the study presented the findings of focus area one and focus area two, respectively. Focus area one revealed the positive and negative impact of fintechs on the South African financial services industry, along with the response strategies employed by regulators and incumbents to mitigate the negative impact. The study also discovered that fintechs have different effects on customers, incumbents, and regulators. Meanwhile, focus area two identified the factors influencing the use of fintechs by consumers in South Africa.

In this section, the frameworks that resulted from the research conducted are explored. Firstly, the roles of each stakeholder in the financial services industry are outlined. Then Figure 5-1, which demonstrates the impact of fintechs on the financial services industry in South Africa is presented. In Chapter 4, the fintech adoption framework in South Africa, which is depicted in Figure 5-2 was thoroughly discussed. These two figures were then combined to form Figure 5-3, which illustrates ‘the financial services equilibrium framework for South Africa’. This framework highlights the importance of collaboration between various industry participants, including incumbent financial institutions, fintech organisations, regulators, and customers, to maintain a state of equilibrium in the financial services industry. This balance will ensure a safe and thriving environment that encourages innovation.

Fintechs

The financial services industry is constantly evolving with fintechs leading the way. To ensure growth, fintechs must remain innovative by creating new business models, products, and services while improving existing ones. However, these efforts can have both negative and positive impacts on incumbents, regulators, and customers. For fintechs to succeed, customers must embrace their products, and regulators must provide effective oversight.

Incumbents

Financial institutions with a long-standing presence in the industry, i.e., the incumbents play a crucial role in providing financial services to the masses. Fintech companies also, sometimes depend on these institutions as they require sponsor banks to operate in the mobile payment sector in South Africa. To prevent losing market share to naturally innovative fintechs, incumbents must continue to innovate on their own and stay ahead of the curve. Further, to remain relevant, incumbents must find strategies to mitigate the negative impact of fintechs. The findings of this study suggest that these tactics could involve partnering with fintechs, broadening the bank's responsibilities, improving employee skills, enhancing customer satisfaction, decreasing service fees, adopting fintech approaches, and purchasing fintech startups.

Regulators

The stability and integrity of the financial services industry depend on the crucial role played by regulators. Without a sound regulator, a safe and thriving financial services industry cannot exist. The emergence of fintechs has introduced risks to the industry as some fintechs operate outside the traditional regulatory framework. Therefore, regulators must find ways to mitigate these risks to protect the industry's integrity and consumers from fraudulent activities and cybercrimes. A well-regulated financial services industry will also inspire consumers to adopt fintechs by alleviating their fears of using these technologies. In South Africa, the financial services regulator has expanded the regulatory framework to include fintechs, ensuring a balance between compliance and innovation. The regulator has established regulatory sandboxes, the Innovation Hub, the Intergovernmental Fintech Working Group, the Rapid Payment Programme, the Payment Industry Body, the National Payment System Framework, and the Vision 2025 Strategy.

Consumers

Consumers are the most important component in the success of the financial services industry because all the innovations made are aimed at enhancing their experience, attracting their attention, and convincing them to utilise the products and services offered. Fintechs have emerged as a prime example of such innovations, providing consumers with various benefits such as reduced service fees, personalised options, financial inclusion, and accessibility at any time and location. Therefore, it is essential that consumers adopt fintechs. However, despite these advantages, the adoption of fintechs among consumers is disappointingly low. This is concerning because for the industry to thrive, consumers must embrace and utilise the technologies provided by financial services institutions.

The study's findings suggest that financial institutions have a crucial role to play in encouraging consumers to embrace fintechs. This involves making sure that the necessary infrastructure for utilising fintechs is readily accessible, and costs associated with adopting fintechs are reasonable. Additionally, financial institutions must educate consumers about fintechs to increase awareness. Regulators also need to minimise the risks of using fintechs to build trust among consumers.

The above is illustrated in Figure 5-1.

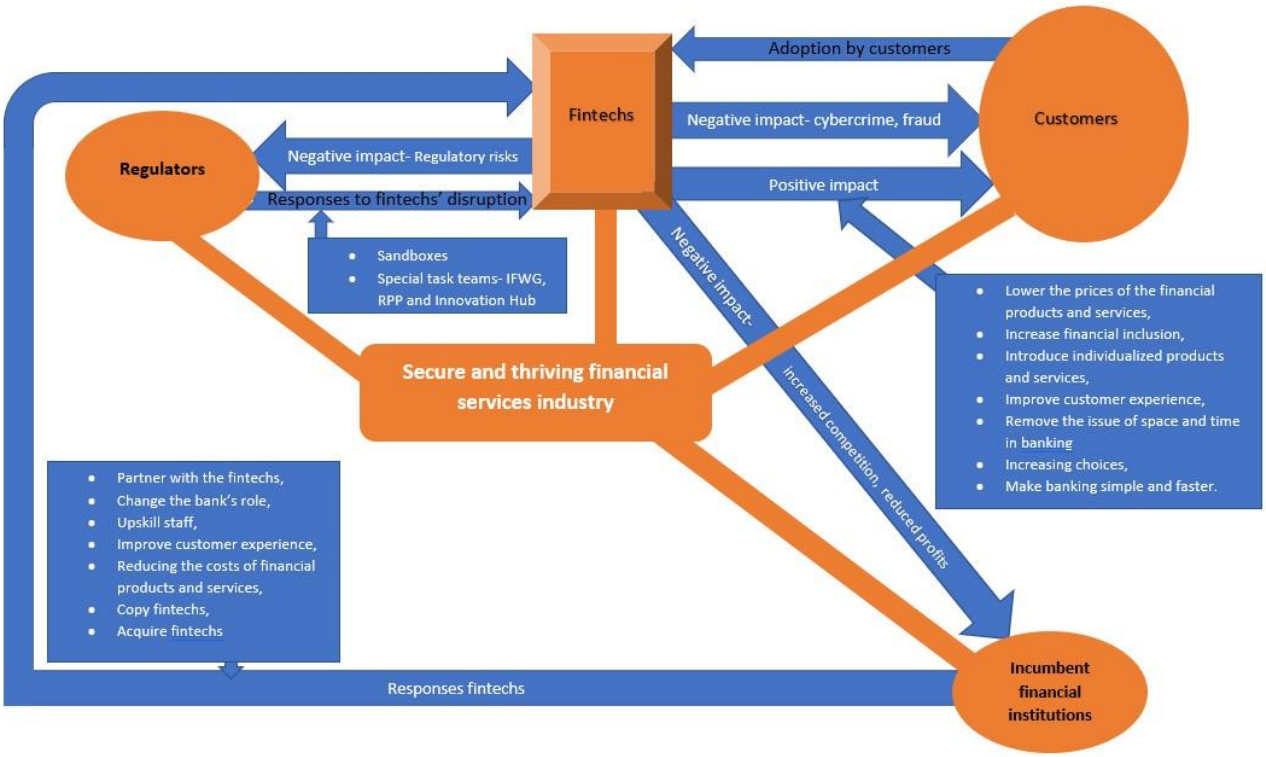


Figure 5-1 The impact of fintechs on the financial services industry in South Africa

The results of the study indicate that several factors play a role in the adoption of fintechs by customers in South Africa, as shown in Figure 5-2:

- **Facilitating conditions:** To utilise financial technologies, customers require the necessary technical support such as access to apps or the internet through airtime or data, a compatible device (such as a mobile phone), and a reliable internet connection. Meeting these requirements increases the likelihood of customers adopting these technologies.
- **Self-efficacy:** Customers will feel more comfortable adopting fintechs if they believe they possess the necessary skills to use them.
- **Perceived trust:** One crucial aspect that influences consumers' willingness to adopt fintechs is their perception of trustworthiness. If they feel confident and secure in the provider of financial technology, they are more likely to adopt it. Therefore, fintechs must improve brand perception by consumers so that they can adopt.

- **Ubiquity:** One benefit of financial technologies is the convenience that comes with removing space and time in banking. This allows consumers to do banking or financial transactions anytime and anywhere.
- **Perceived risk:** The adoption of fintech as an alternative to traditional banking heavily relies on customers' perception of associated risks. If a customer perceives financial technologies as risky, they are less likely to adopt them.
- **Perceived cost:** The perceived cost of using fintech refers to the expenses that customers anticipate incurring. If they believe that the unit cost is too high, they are less likely to use it.

There is a noticeable lack of awareness about the advantages of using fintechs among consumers in South Africa, largely due to insufficient education. To foster self-efficacy, it is crucial to educate and promote awareness of fintechs. Furthermore, gender and age are moderators of adoption.

For a well-rounded, safe, and prosperous financial services system, individuals need access to the necessary infrastructure such as data and devices to utilise fintechs. They must also trust the providers of financial technology, experience low costs associated with fintech use, and have their risks mitigated. Additionally, it is crucial that they understand the benefits and convenience of using fintechs and have confidence in their own ability to use them.

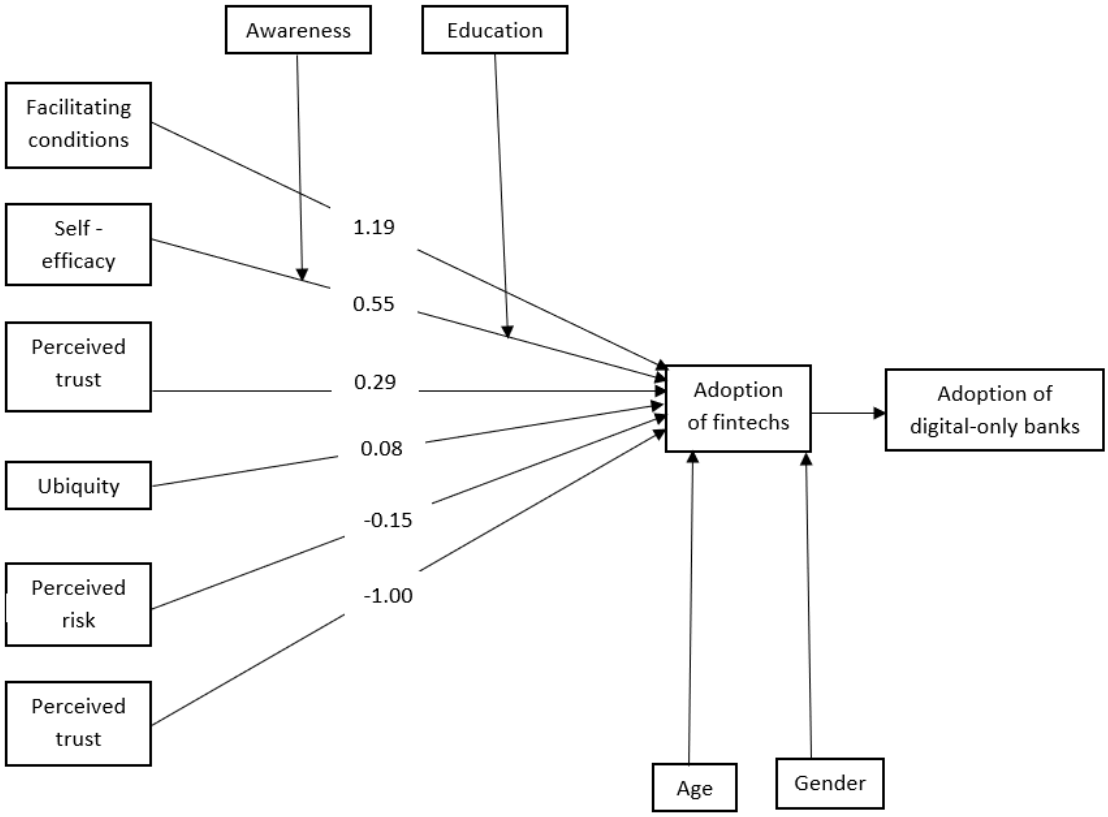


Figure 5-2 A fintech adoption model in South Africa

To cultivate a thriving and secure financial services industry ecosystem in South Africa that encourages innovation, it is crucial for all industry players - including incumbents, fintech organisations, regulatory bodies, and customers - to work together in unison without introducing any risks or harm to the industry. To visually represent this, a framework, figure 5-3, has been developed that combines the impact of fintechs on the financial services industry in South Africa (Figure 5-1) and the fintech adoption model in South Africa (Figure 5-2).

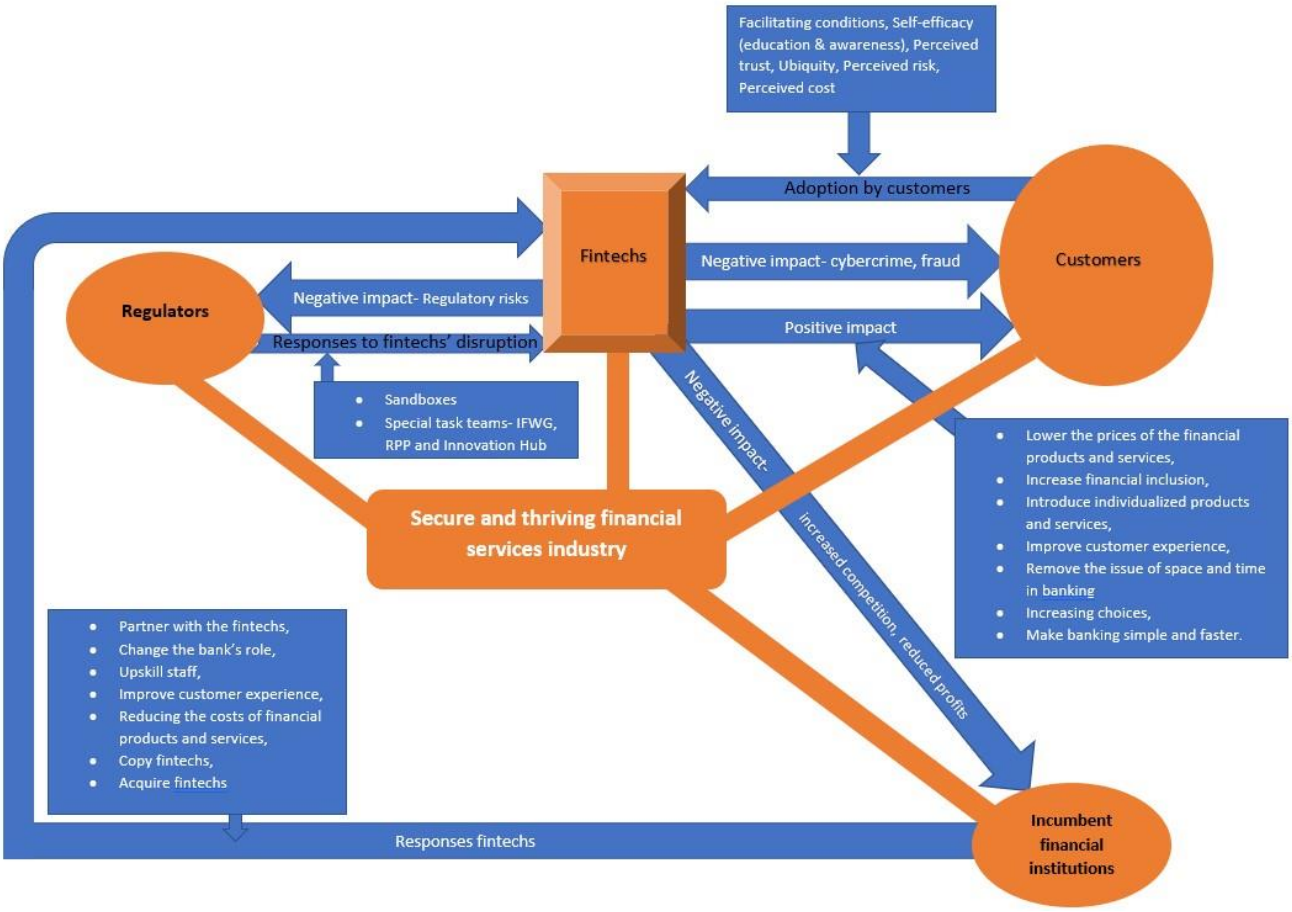


Figure 5-3 The financial services equilibrium framework for South Africa

5.4. CONCLUSION

This chapter discussed the research findings. These findings were summarised and compared to the existing literature. The frameworks, i.e., the fintech adoption model, the impact of fintechs on the financial services industry in South Africa and the financial services equilibrium framework for South Africa, were also presented.

The next chapter concludes the research, provides recommendations, and discusses the research's contributions.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

The aim of this thesis was to investigate the disruptive impact of financial technologies on the financial services industry in South Africa. To accomplish this goal, which is of great interest to academic researchers, regulators, financial services leaders, and financial services customers, the research was designed to seek answers to four research questions and achieve the following objectives:

- To explore the impact (challenges and benefits) of fintechs such as digital-only banks in the financial services industry in South Africa.
- To investigate incumbents' and regulators' strategic realignment to fintechs disruptions in South Africa.
- To investigate the factors influencing consumers to use financial technology such as digital-only banks in South Africa.
- To determine if the COVID-19 pandemic has impacted the adoption of fintechs in South Africa.

To achieve these objectives, the study was divided into two interrelated focus areas- impact of fintechs and fintechs adoption. The findings of these two focus areas were presented in chapter 4 and discussed in chapter 5. This chapter presents the conclusions drawn from these findings. It examines the connection between the research questions, objectives, and study aim. The chapter also includes research-based recommendations.

Motivation and objectives of the study

Although fintech has emerged as a hot topic in the financial services industry, understanding of its application, impact, and how regulators and incumbent financial institutions respond to its disruption has been limited. Further, the adoption in emerging economies is disappointingly low. Therefore, this study aimed to provide a comprehensive understanding of how the emergence of fintechs is reshaping the financial services industry and to explore the factors that influence consumers to adopt fintechs in South Africa.

Research design

The four objectives developed to fulfil the research aim and aid in developing the fintech adoption framework and impact of the fintechs framework were all accomplished using mixed methods. Mixed methods provided an in-depth analysis of the impact of fintechs, the impact of the COVID-19 pandemic and factors influencing consumers to adopt fintechs. Interviews with eighteen industry experts and seventeen banked consumers were used to delve deep into the phenomena. Questionnaires were used to triangulate the qualitative findings and to develop the fintechs adoption framework. Atlas.ti was used to analyse qualitative data gathered using the interviews, SPSS 28 was used to analyse the quantitative data collected using questionnaires, and Amos 27 was used to develop the fintech adoption model. Exploratory factor analysis was used to investigate the underlying theories behind fintech adoption, and structural equation modelling was used to develop the fintech adoption model.

Research findings and their implication:

Research Objective 1

The first research objective was to explore the impact of fintechs on the financial services industry in South Africa. This objective was achieved, and the findings showed that fintechs present the industry with challenges (negative impact) and opportunities (positive impact). The challenges presented by fintechs include lowering the prices of financial products and services. This ends up hurting the incumbents because it reduces industry profits. Moreover, fintechs have exposed that incumbents are not agile enough and are slow to respond to customer demands and industry changes due to their legacy systems and bureaucracy. Fintechs also increase competition for the incumbents.

It is important for leaders of incumbent organisations to have a thorough understanding of how fintechs are impacting the industry. This knowledge will enable them to respond effectively and mitigate any potential negative impacts on their companies and the industry. By doing so, they can identify strategies to manage disruptions and protect their market share. If they fail to act, they risk losing ground to more innovative fintech companies and becoming irrelevant in the industry.

Fintechs usually fall outside the traditional regulatory framework, and thus introduce new regulatory risks into the industry. This creates an 'uneven playing field' because incumbents invest massive amounts of money to ensure regulatory compliance while fintechs are not subjected to the same regulatory scrutiny. Consequently, fintechs end up gaining an unfair advantage.

Regulators must have a comprehensive understanding of the risks presented by fintechs to respond effectively and safeguard the industry from unwarranted risks. Inadequate comprehension may lead to hasty and inadequate responses, endangering the credibility of the industry.

The opportunities presented by fintechs in the financial services industry include lowering the cost of financial services and products so that customers can get the products and services at reduced costs, improving efficiency, improving customer experience by introducing personalised products and services, increasing financial inclusion by extending financial services to the previously overlooked or underserved customers, increasing options for customers so that if they are not happy with their financial institution they can switch to another, bringing convenience by removing the question of space and time so that customers can access financial services on their mobile devices such as phones and computers anytime and anywhere, making the industry more competitive, introducing new growth opportunities for the industry players (extending financial services to previously unserved areas), reducing operational costs for the financial institutions and making the industry more innovative.

It is important for the incumbents in the financial services industry to seize these opportunities to improve and create a more consumer-friendly experience.

Research Objective 2

The second research objective was to investigate incumbents' and regulators' strategic realignment to fintechs disruptions in South Africa. This objective had two focuses, i.e., focus one- incumbents' response strategies and focus two- regulators' response strategies. The study achieved the first focus of this research objective by uncovering the response strategies used by the incumbent financial institutions. These strategies include interoperability, collaborating and partnering with the fintechs to form symbiotic relationships, expanding the role of the

banks so that the banks can provide more services, including those that are non-financial, upskilling their staff so that they are ready for the industry changes, improving customer experience, copying the fintechs and acquiring the fintech, and lowering the costs of financial products and services in order to compete. Such interventions can bring about new growth opportunities, leading to reshaping of the financial services industry and the economy.

This objective's second focus was to identify key strategies by the financial regulators to respond to fintech disruption. Pursuant to the findings, these strategies include the establishment of new regulatory frameworks and bodies like the Intergovernmental Fintech Working Group, the National Payment System Framework and Strategy Vision 2025, the Payment Industry Body, the National Payment Systems Department, the Rapid Payments Programme, the Innovation Hub, and the sandboxes. These interventions have been made to broaden the regulatory framework to incorporate fintechs and encourage innovation in the industry.

Research Objective 3

The third objective of this research was to investigate the factors influencing consumers to use financial technologies, such as digital-only banks in South Africa. This objective was achieved. The research found that the key factors influencing the adoption of fintechs in South Africa are perceived cost, perceived risk, perceived trust, self-efficacy, facilitating conditions, convenience, ubiquity, awareness, and education. This means that financial services institutions must ensure that their financial products or platforms are safe and secure and comply with regulatory requirements. Awareness and education were found to be the determinants of self-efficacy. Therefore, to improve consumers' self-efficacy, it is imperative that financial services institutions create awareness and educate consumers about the benefits, risks associated with using fintechs and how to use fintechs. To improve the adoption of fintechs, financial institutions must also help the consumers by ensuring that the facilitating conditions that will enable the consumers to use fintechs are available. This includes things like mobile data and compatible mobile devices. Mobile data has been a topical issue in South Africa due to its prohibitive costs. According to the study, adoption will increase if financial institutions can zero-rate their platforms and provide customers with data like Standard Bank

does with the Mymo account. This account provides active users with R50 in airtime and 250MB of data per month.

Research Objective 4

The fourth objective of the research was to determine if the COVID-19 pandemic has impacted the adoption of fintechs in South Africa. This research objective was achieved, and the study showed that the COVID-19 pandemic positively impacted the adoption of fintechs in South Africa. The study found that the emergence of the COVID-19 pandemic forced the incumbent financial services institutions to urgently launch digital business models that could have taken years to be launched under normal circumstances. The research also discovered that the emergence of the COVID-19 pandemic accelerated the adoption of fintech by consumers.

6.1. RECOMMENDATIONS

The recommendations that came out of this study are discussed below.

Fintechs must scale: The study shows that the major hurdle faced by fintechs is the difficulty in expanding their businesses. The lack of scalability restricts their potential for growth. Hence, to bring about a significant transformation in the industry, fintechs need to find effective ways to scale their operations.

Fintechs must be transparent: Fintechs are likely to gain greater interest and trust among consumers if they prioritise transparency. To achieve this, it is important for fintech players to offer more education on the risks and benefits associated with use, so that consumers can make informed decisions.

Fintechs must not completely do away with human-to-human interactions: Despite the rise of automated fintech models, products, and services, human-to-human interactions are still crucial. Call centres and messaging technologies such as WhatsApp can facilitate these interactions. It is essential to have skilled personnel behind these channels to guide customers through their adoption journey and provide customer service. Real-time customer service is highly valued, and customers want the assurance of being able to contact a human representative when necessary, such as when they have sent money to the wrong account. Tymebank's utilisation of consultants at Pick 'n Pay and Boxer stores to assist customers with

account opening and other bank-related queries is an excellent example of the importance of human-to-human interaction in the financial services industry.

Fintechs must ensure that transactions are secure: Consumers often express apprehension towards using fintechs due to the perceived risks associated with financial technologies. Since fintechs handle people's money, there is a significant concern about fraud and cybercrime leading to substantial financial losses. To ensure consumer safety, fintechs must prioritise cybersecurity and implement robust fraud prevention measures.

Fintechs must comply with the regulations: On social media platforms such as Instagram, Twitter, and Facebook, there are numerous fraudulent individuals posing as investment brokers working for cryptocurrency investment firms. They try to persuade consumers to invest in their companies. To prevent such incidents, fintechs need to comply with regulations and operate within the regulatory framework. This would assure customers that there is some recourse available if anything goes wrong, like traditional banks where people trust regulators to intervene if necessary.

Regulators must regulate fintechs like they regulate the incumbents: To ensure a level playing field, it is necessary to expand the regulatory framework because it is unfair if the incumbents are heavily regulated while fintechs are not. This imbalance can damage the reputation of the financial services industry. Regulators should also be mindful of the potential burdens of regulation, which can make it difficult and costly to operate. Ultimately, the goal should be to promote innovation and growth while maintaining stability in the industry.

Regulators must introduce open banking: It is important for regulators to permit fintechs to operate in the payments sector without relying on a sponsor bank. This will enable a greater number of fintech companies to participate in the industry, resulting in a wider range of products and services. This will further enhance financial inclusion.

Financial institutions must create awareness and educate consumers: It is important for financial institutions to prioritise educating consumers about the advantages and appropriate usage of technological advancements. Simply advertising on online platforms is not enough. To effectively raise awareness, these institutions should utilise additional advertising platforms that can reach a wider audience.

Financial services institutions must provide facilitating conditions and reduce the cost of using fintechs: There are several factors that hinder the adoption of fintech, including the costs

associated with using fintechs and availability of the infrastructure that enables consumers to use fintechs. If the necessary infrastructure for using fintech services is not available, or if enablers such as data or airtime are costly, customers may be discouraged from adopting fintech. To encourage adoption, financial institutions should ensure that the enabling infrastructure is in place and that the costs of using fintech are not prohibitively high. For example, the financial institutions can assist consumers by offering zero-rated applications.

Recommendations from questionnaires

Recommendations from the questionnaires are presented verbatim in Table 6-1.

Table 6-1 Recommendations from questionnaires

"Digital banking provides convenience; the banking industry needs to tighten and invest in security around digital banking. It is also important to ensure that the digital platform is easy to use."
"Digital banking is a most efficient and time effective way of banking."
"Educate older people on how to use these platforms as they are not familiar with technology."
"Improve education around the various platforms in order to increase adoption amongst South Africans."
"Cost of data and education for older people on how to use digital platforms. Also, the recovery plan in instances where you lose your cell phone. Introduce a subtle emergency button to alert the bank or police in kidnapping situations. Something like share location."
"More banking apps need to have their data usage zero-rated to ensure more adoption by consumers."
"Advertise these services in traditional mainstream media. Educate people. Assure the customers about enough immediate, preferably real-time, support in case the transaction fails."
"Needs to be more accessible to the general population. And secured correctly."
"Improve security. It is becoming riskier to use digital banking. The verification process must be tightened."
"I'm old school and still love the idea of human interaction."
"My main issue is that my current bank offers me all the digital functionality without including branch banking options. Sometimes a problem can only be solved by going into a branch and speaking to someone face-to-face. This is an important option for me, which does not exist with digital-only banks, yet one can get all the benefits of a digital-only bank from 'traditional' banks."
"Digital banks should provide all services (e.g., mortgages, car finance, insurance) provided by non-digital banks."

6.2. CONTRIBUTIONS OF THE STUDY

The section that follows details the contributions of this thesis.

Theoretical contributions

Breidbach, Keating, and Lim (2019) suggest that fintech research is vital in expanding financial service digitisation knowledge and resolving business leadership and societal challenges. However, there needs to be more research regarding the impact of fintechs on the financial services industry in developing economies. This study contributed to closing this gap by uncovering the impact of fintechs on various industry role players (incumbents, regulatory bodies, and customers) using insights from industry experts. The findings shed light on what the future holds for the different stakeholders and broadened the theoretical understanding of the role of fintechs in the financial services industry. It delved into the impact of fintechs in the financial services industry and provided a holistic understanding of this field in emerging economies.

The study offers helpful insights on how business leaders from the incumbents can leverage fintech advancements to improve competitiveness. It also outlines regulatory strategies to mitigate risks associated with fintech disruptions. From these, fintech organisations can learn how to foster innovation without introducing unnecessary risks to the industry.

Further, the study is a significant addition to existing knowledge on fintechs, specifically digital-only banks and their acceptance among consumers. It takes a major leap forward by investigating digital-only banks, which have not received much attention in South Africa until now. The research has made valuable contributions towards creating a fintech adoption framework for South Africa. This framework will play a crucial role in boosting fintech adoption rates. Moreover, it has also developed a framework that illustrates the impact of fintechs in the country. This framework highlights the impact felt by various stakeholders and how they have responded to the disruptions brought on by fintechs.

This study's unique infrastructure will benefit academia by expanding the body of knowledge surrounding fintech research. This can inspire future research on fintech and its applications.

Practical contributions

This research delves into the impact of fintechs in the financial services industry, highlighting their positive and negative impacts. Financial services leaders can effectively respond to fintech's impact and devise strategies to stay competitive by understanding this impact. The study also emphasises the importance of capitalising on fintech's positive impact and strengthening regulations to protect the industry's stability and credibility. Additionally, the research provides guidelines for the leaders of fintech organisations on how to innovate while adhering to regulatory requirements and how to collaborate with incumbents to benefit from their expertise. The study suggests several important actions that leaders of financial services regulators should take to address and minimise the risks posed by fintechs in the financial services industry.

This study has made significant contributions, including developing a framework that illustrates the impact of fintechs on South Africa's financial services industry. The framework provided here aims to assist industry leaders in comprehending effective strategies that can minimise negative impacts while maximising positive impacts. By evaluating the impacts of fintechs on different stakeholders including incumbents, fintech organisations, regulators, and customers, leaders can gain a better understanding of how to mitigate any unfavourable consequences. This framework and the financial services equilibrium framework in South Africa will help safeguard the industry's credibility and stability while fostering an innovative, secure, and thriving financial services sector where all participants operate harmoniously. The financial services equilibrium framework highlights the importance of collaboration and balance between industry players to ensure a flourishing financial services industry. This study significantly contributes to achieving sustainable development goal number nine (9). This goal emphasises the importance of developing resilient infrastructure, promoting sustainable and inclusive industrialisation, and fostering innovation in industries.

Despite significant investment in financial technology, adoption rates in emerging economies have remained low. To address this challenge, a fintech adoption framework was developed to identify factors influencing consumer adoption of fintech in South Africa. Financial institution leaders can use these critical factors to develop behaviour change strategies aimed at increasing fintech adoption. Such strategies may include zero-rating apps, providing customers with basic

airtime or data to transact digitally, or offering starter packs that include basic smartphones and SIM cards for cost-free transactions. Additionally, leaders of financial institutions must ensure that there are robust cybersecurity and fraud prevention measures in place to protect customers from online scams and cybercrimes. The study showed that human-to-human interactions should not be eliminated, and call centres and messaging platforms such as WhatsApp can help improve response times to customer queries and build trust in fintech. Financial institutions can increase consumer trust and overcome barriers to fintech adoption by addressing these concerns.

Lastly, at a critical time when South Africa is building smart cities, this research provides invaluable insights that will contribute to this initiative by incorporating this critical component (fintechs) of the economy into these developments.

6.3. THE LIMITATIONS OF THE STUDY

Even though the research methodology used is based on a rich theoretical foundation and whilst all due care was taken in conducting the study, there were some limitations to the study. These are stated below:

- Although the sample was large and diverse, most of those who completed the questionnaire and participated in the interviews live in cities because they work at the headquarters of the financial institutions, which are all based in the cities. Therefore, the results might have some urban bias.
- The data collected might have bias and might only tell the position of the financial institutions represented by the interviewees and questionnaire respondents.
- The study was conducted during the COVID-19 pandemic, which could have influenced the views according to the state then.

6.4. FUTURE RESEARCH

This study can be a foundation for future research into the impact of fintechs on the financial services industries in different countries. The same or similar studies can be conducted in various emerging economies in Africa and abroad.

With regulators expanding the regulatory framework to accommodate fintechs, these changes may have positive and negative implications for the financial services industry's future. As a result, future research could investigate the impact of regulation on the future of the financial services industry. Future studies could also look at the impact of the regulatory interventions proposed in this study after few years from now.

This study also discovered that incumbents' legacy systems limit their innovative capabilities and have caused them to be more risk-averse and less agile than new fintech organisations. It would be interesting to revisit fintech organisations such as digital-only banks in the future, ten or more years later, to see how they performed in their first ten years of operation. Future research could also investigate whether fintechs' 'legacy systems' that they would have developed then would have affected their risk appetite, innovativeness, agility, and speed in responding to industry changes and customer demands.

Further, this study investigated the factors that influence customers' adoption of fintechs across South Africa in its entirety. Also, because of the urban bias of this study, future research could be conducted with a focus on rural areas to see how adoption there compares to other regions like urban and township areas. This is because the availability of facilitating conditions is the greatest challenge in rural areas, as some areas still lack basic resources such as electricity and stable telecommunication networks.

REFERENCES

Ab Hamid, M.R., Sami, W. and Mohmad Sidek, M.H. 2017. 'Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion', *Journal of Physics: Conference Series*, 890(1). Available at: https://doi.org/10.1088/1742-6596/890/1/012163.

Acar, O. and Çitak, Y.E. 2019. 'Fintech integration process suggestion for banks', *Procedia Computer Science*, 158, pp. 971–978. Available at: https://doi.org/10.1016/j.procs.2019.09.138.

Ade Bilau, A., Witt, E. and Lill, I. 2018. 'Research methodology for the development of a framework for managing post-disaster housing reconstruction', *Procedia Engineering*, 212(2017), pp. 598–605. Available at: https://doi.org/10.1016/j.proeng.2018.01.077.

Adner, R. 2002. 'When are technologies disruptive? A demand-based view of the emergence of competition', *Strategic Management Journal*, 23(8), pp. 667–688. Available at: https://doi.org/10.1002/smj.246.

Adrian, T. and Shin, H.S. 2010. 'The changing nature of financial intermediation and the financial crisis of 2007-09'. Available at: https://doi.org/10.1146/annurev.economics.102308.124420.

Adwok, J. 2015. 'Probability sampling - A guideline for quantitative health care research', *Annals of African Surgery*, 12(2), pp. 95–99. Available at: ajol-file-journals_384_articles_126349_submission_proof_126349-4573-343643-1-10-20151126.pdf

Afshan, S. and Sharif, A. 2016. 'Acceptance of mobile banking framework in Pakistan', *Telematics and Informatics*, 33(2), pp. 370–387. Available at: https://doi.org/10.1016/j.tele.2015.09.005.

Aghion, P., Bergeaud, A., Boppart, T., Klenow, P. J., and Li, H. 2019. 'Missing growth from creative destruction', *American Economic Review*, 109(8), pp. 2795–2822. Available at: https://doi.org/10.24148/wp2017-04.

Ajibade, P. 2019. 'Technology acceptance model limitations and criticisms: Exploring the practical applications and use in technology-related studies, mixed-method, and qualitative

researches', *Library Philosophy and Practice*, 2019. Available at: https://core.ac.uk/download/pdf/189486068.pdf.

Alblooshi, F.S.A.K. 2022. 'FinTech in the United Arab Emirates: A general introduction to the main aspects of financial technology', *Entrepreneurial Rise in the Middle East and North Africa: The Influence of Quadruple Helix on Technological Innovation*, pp. 163–178. Available at: https://doi.org/10.1108/978-1-80071-517-220221010.

Alhojailan, M.I. 2012. 'Thematic analysis: A critical review of its process and evaluation', 1(1), pp. 39–47. Available at: https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=1632420

Ali, M., Raza, S. A., Khamis, B., Puah, C. H., and Amin, H. 2021. 'How perceived risk, benefit and trust determine user Fintech adoption: a new dimension for Islamic finance', *Foresight*, 23(4), pp. 403–420. Available at: https://doi.org/10.1108/FS-09-2020-0095.

Alkhowaiter, W.A. 2020. 'Digital payment and banking adoption research in Gulf countries: A systematic literature review', *International Journal of Information Management*, 53(September 2019), p. 102102. Available at: https://doi.org/10.1016/j.ijinfomgt.2020.102102.

Al-Saedi, K., Al-Emran, M., Ramayah, T., and Abusham, E. 2020. 'Developing a general extended UTAUT model for M-payment adoption', *Technology in Society*, 62(September 2019), p. 101293. Available at: https://doi.org/10.1016/j.techsoc.2020.101293.

Ambrosius, W.T. 2007. *Topics in Biostatistics*, *Humana Press Inc, New Jersey*. Available at: https://doi.org/10.1109/ICICS.2015.7459974.

Amin, H., Hamid, M. R. A., Lada, S., and Anis, Z. 2008. 'The adoption of mobile banking in Malaysia: The case of Bank Islam Malaysia Berhad (Bimb)', *International Journal of Business and Society*, 9(2), p. 43. Available at: http://www.ijbs.unimas.my/repository/pdf/vol9no2(abs5).pdf.

Amin, H. 2009. 'An analysis of online banking usage intentions: An extension of the technology acceptance model', *International Journal of Business and Society*, 10(1), pp. 27–40.Available at: https://www.semanticscholar.org/paper/An-analysis-of-online-banking-usage-intentions-%3A-An-Amin/c790a83c129ebf63cdfbb2bbcd1a0cd96085a7ed

Amin, M. E. K., Nørgaard, L. S., Cavaco, A. M., Witry, M. J., Hillman, L., Cernasev, A., and Desselle, S. P. 2020. 'Establishing trustworthiness and authenticity in qualitative pharmacy research', *Research in Social and Administrative Pharmacy*, (September 2019), pp. 0–1. Available at: https://doi.org/10.1016/j.sapharm.2020.02.005.

Anagnostopoulos, I. 2018. 'Fintech and regtech: Impact on regulators and banks', *Journal of Economics and Business*, 100(July), pp. 7–25. Available at: https://doi.org/10.1016/j.jeconbus.2018.07.003.

Ardity, A. 2020. *COVID-19 speeds up move to cashless payments: report*. Johannesburg. Available at: https://www.enca.com/business/covid-19-speeds-move-cashless-payments-report [Accessed: 10 February 2021].

Armstrong, R. 2019. 'Critical realism and performance measurement and management: Addressing challenges for knowledge creation', *Management Research Review*, 42(5), pp. 568–585. Available at: https://doi.org/10.1108/MRR-05-2018-0202.

Arner, D.W., Barberis, J. and Buckley, R.P. 2017. RegTech: Building a better financial system. 1st edn, Handbook of Blockchain, Digital Finance, and Inclusion, Volume 1: Cryptocurrency, FinTech, InsurTech, and Regulation. 1st edn. Elsevier Inc. Available at: https://doi.org/10.1016/B978-0-12-810441-5.00016-6.

Arner, D.W., Barberis, J.N. and Buckley, R.P. 2015. 'The Evolution of Fintech: A new post-crisis paradigm?', *Ssrn* [Preprint]. Available at: https://doi.org/10.2139/ssrn.2676553.

Arslan, A., Buchanan, B. G., Kamara, S., and Al Nabulsi, N. 2021. 'Fintech, base of the pyramid entrepreneurs and social value creation', *Journal of Small Business and Enterprise Development* [Preprint]. Available at: https://doi.org/10.1108/JSBED-10-2020-0370.

Asnakew, Z.S. 2020. 'Customers' continuance intention to use mobile banking: Development and testing of an integrated model', *The Review of Socionetwork Strategies*, 14(1), pp. 123–146. Available at: https://doi.org/10.1007/s12626-020-00060-7.

Assink, M. 2006. 'Inhibitors of disruptive innovation capability: A conceptual model', *European Journal of Innovation Management*, 9(2), pp. 215–233. Available at: https://doi.org/10.1108/14601060610663587.

Astalin, P.K. 2013. ‘Qualitative research designs: A conceptual framework’, *International Journal of Social Science & Interdisciplinary Research*, 2(1), pp. 119–124. Available at: https://doi.org/10.1063/1.2163485.

Auta, E.M. 2010. ‘E-Banking in developing economy: Empirical evidence from Nigeria.’, *Journal of Applied Quantitative Methods*, 5, pp. 212–222. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=63021688&site=ehost-live.

AutonomousNext 2018. *Machine intelligence & augmented finance*, *Autonomous Research*. Available at: https://doi.org/10.1016/0166-3615(86)90070-9.

Avenier, M. and Thomas, C. 2015. ‘Finding one’s way around various methodological guidelines for doing rigorous case studies: A comparison of four epistemological frameworks’, *Systèmes d’information & management*, 20(1), p. 61. Available at: https://doi.org/10.3917/sim.151.0061.

Awanis, A., Lowe, C., Anderson-Manjang, Simon. K., and Lindsey, D. 2022. *State of the industry report on mobile money*. Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/03/GSMA_State-of-the-Industry-Report-on-Mobile-Money_2016.pdf.

Baber, H. 2019. ‘Financial inclusion and Fintech: A comparative study of countries following Islamic finance and conventional finance’, *Qualitative Research in Financial Markets*, 12(1), pp. 24–42. Available at: https://doi.org/10.1108/QRFM-12-2018-0131.

Babuna, P., Yang, X., Gyilbag, A., Awudi, D. A., Ngmenbelle, D., and Bian, D. 2020. ‘The impact of covid-19 on the insurance industry’, *International Journal of Environmental Research and Public Health*, 17(16), pp. 1–14. Available at: https://doi.org/10.3390/ijerph17165766.

Bahari, S.F. 2010. ‘Qualitative versus quantitative research strategies: Contrasting epistemological and ontological assumptions’, *Jurnal Teknologi*, 52(1), pp. 17–28. Available at: https://doi.org/10.11113/jt.v52.134.

Baldwin, R.; and di Mauro, B. 2020. *Economics in the time of COVID-19*, *CEPR Press*. London: CEPR Press.

Bansal, N. and Jain, M. 2018. 'Progress in digital banking after demonetization: Some evidence', *IUP Journal of Bank Management*, 17(2), pp. 50–59. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=129950580&site=ehost-live.

Baret, S., Celner, A., O'Reilly, M., and Shilling, M. 2020. 'COVID-19 potential implications for the banking and capital markets sector', *Deloitte Insights*, pp. 1–18. Available at: https://www2.deloitte.com/cn/en/pages/financial-services/articles/banking-and-capital-markets-impact-covid-19.html.

Barna, F., Nachescu, M.L. and Dumbravenu, A.A. 2013. 'Financial innovation and the current economic crisis: Do the benefits outweigh the disadvantages?', *Ovidius University Annals, Economic Sciences Series*, XIII (1), pp. 1091–1096.Available at: https://stec.univ-ovidius.ro/html/anale/ENG/cuprins%20rezumate/volum2013p1.pdf.

Basri, S. (2018) 'Determinants of adoption of mobile banking: Evidence from rural Karnataka in India', *International Journal of Trade and Global Markets*, 11(1–2), pp. 77–86. Available at: https://doi.org/10.1504/IJTGM.2018.092490.

Baxter, J. and Chua, W.F. 2019. 'Using critical realism in critical accounting research – a commentary by two ANTs', *Accounting, Auditing and Accountability Journal*, 33(3), pp. 655–665. Available at: https://doi.org/10.1108/AAAJ-09-2019-4164.

Bellan, S. 2018. 'Robotics vs machine learning vs artificial intelligence for the right problems', *The Credit & Financial Management Review*, 24(2), pp. 1–11. Available at: https://www.researchgate.net/profile/Shankar-Bellam/publication/348250525_Robotics_vs_Machine_Learning_vs_Artificial_Intelligence_Identifying_the_Right_Tools_for_the_Right_Problems/links/5ff50605299bf1408874e502/Robotics-vs-Machine-Learning-vs-Artificial-Intelligence-Identifying-the-Right-Tools-for-the-Right-Problems.pdf.

Berlin, D.B. 2011. Characteristics of disruptive innovation within the medical device industry. Massachusetts Institution of Technology. Available at: https://dspace.mit.edu/bitstream/handle/1721.1/68462/769131992-MIT.pdf?sequence=2&isAllowed=y.

Block, D. 2013. ‘Disruptive innovation: contributing to a value-based health care system.’, *Physician executive*, 39(5), pp. 46–50, 52. Available at: http://www.ncbi.nlm.nih.gov/pubmed/24180188.

Boratyńska, K. 2019. ‘Impact of digital transformation on value creation in Fintech services: An innovative approach’, *Journal of Promotion Management*, 25(5), pp. 631–639. Available at: https://doi.org/10.1080/10496491.2019.1585543.

Boulton, C. 2018. *What is RPA? A revolution in business process automation | CIO*, *CIO*. Available at: https://www.cio.com/article/3236451/what-is-rpa-robotic-process-automation-explained.html [Accessed: 14 February 2021].

Bowen, G.A. 2008. ‘Naturalistic inquiry and the saturation concept: A research note’, *Qualitative Research*, 8(1), pp. 137–152. Available at: https://doi.org/10.1177/1468794107085301.

Bower, J L and Christensen, C.M. 1995. ‘Disruptive technologies: Catching the wave’, *Harvard Business Review*, 73(1), pp. 43–53. Available at: https://doi.org/10.1016/0024-6301(95)91075-1.

Brătăşanu, V. 2018. ‘Digital innovation the new paradigm for financial services industry’, *Theoretical and Applied Economics*, pp. 84–94. Available at: http://store.ectap.ro/suplimente/International_Finance_and_Banking_Conference_FIBA_2017_XV.pdf.

Braun, V. and Clarke, V. 2006. ‘Using thematic analysis in psychology’, *Qualitative Research in Psychology*, 3, pp. 77–101. Available at: https://doi.org/10.1191/1478088706qp063oa.

Braun, V. and Clarke, V. 2012. ‘Thematic analysis’, in H. Cooper (ed.) *APA Handbook of Research Methods in Psychology*. Washington DC: American Psychological Association, pp. 57–71. Available at: https://doi.org/10.1037/13620-004.

Breidbach, C.F., Keating, B.W. and Lim, C. 2019. ‘Fintech: research directions to explore the digital transformation of financial service systems’, *Journal of Service Theory and Practice*, 30(1), pp. 79–102. Available at: https://doi.org/10.1108/JSTP-08-2018-0185.

Britten, N. 1995. ‘Qualitative interviews in medical research’, *British Medical Journal*, 311(6999), pp. 251–253. Available at: https://doi.org/10.1136/bmj.311.6999.251.

van den Broek, T. and van Veenstra, A.F. 2018. ‘Governance of big data collaborations: How to balance regulatory compliance and disruptive innovation’, *Technological Forecasting and Social Change*, 129(November 2017), pp. 330–338. Available at: https://doi.org/10.1016/j.techfore.2017.09.040.

Brown, I., Cajee, Z., Davies, D., and Stroebel, S. 2003. ‘Cell phone banking: Predictors of adoption in South Africa - An exploratory study’, *International Journal of Information Management*, 23(5), pp. 381–394. Available at: https://doi.org/10.1016/S0268-4012(03)00065-3.

Brown, I., Stander, A., Hoppe, R., Mugera, P., and Newman, P. 2004. ‘The impact of national environment on the adoption of internet banking: Comparing Singapore and South Africa’, *Journal of Global Information Management*, 12(2), pp. 1–27. Available at: https://doi.org/10.4018/9781591404682.ch014.

Bruggink, D. and Mouilleron, E. 2016. ‘Success factors for the deployment of financial technology’, *Journal of Payments Strategy & Systems*, 10(4), pp. 396–400. Available at: https://hstalks.com/article/1617/download/.

Bruun, E.P.G. and Duka, A. 2018. ‘Artificial intelligence, jobs and the future of work: Racing with the machines’, *Basic Income Studies*, 13(2), pp. 1–16. Available at: https://doi.org/10.1515/bis-2018-0018.

Bryant, F.B., Yarnold, P.R. and Michelson, E.A. 1999. ‘Statistical methodology’, *Academic Emergency Medicine*, 6(1), pp. 54–66. Available at: https://doi.org/10.1111/j.1553-2712.1999.tb00096.x.

Bryman, A. 2012. *Social research methods*. 4th edition. Oxford: Oxford University Press.

Buckley, R., Arner, D.W. and Barberis, J.N. 2016. ‘150 Years of Fintech: An evolutionary analysis’, *JASSA, No. 3, 2016: 22-29.* [Preprint], (January). Available at: https://www.researchgate.net/publication/313364787_150_Years_of_FinTech_An_Evolutionary_Analysis/link/5897eace4585158bf6f59e3d/download.

Bughin, J., Hazan, E., Ramaswamy, S., Chui, M., Allas, T., Dahlstrom, P., Henke, N., and Trench, M. 2017. Artificial intelligence – the next frontier in IT security? McKinsey Global Institute. Available at: https://doi.org/10.1016/S1353-4858(17)30039-9.

Bureau, S. 2013. ‘Entrepreneurship as a subversive activity: How can entrepreneurs destroy in the process of creative destruction?’, *M@n@gement*, 16(3), pp. 204–237. Available at: https://scholar.google.com/scholar_url?url=https://polarresearch.net/index.php/mgmt/article/download/4026/9762&hl=en&sa=T&oi=gsb-gga&ct=res&cd=0&d=4938377195990850 4&ei=sR0hZevuM7CCy9YP542GgAs&scisig=AFWwaebbAv2Jyeo8Wtvc58FFIRz8.

Businesstech 2018. *Is Capitec now the biggest bank in South Africa? Businesstech*. Available at: https://doi.org/10.1590/s1809-98232013000400007.

Businesstech 2021. *Bank Zero is open for business*, *Businesstech*. Available at: https://businesstech.co.za/news/banking/511874/bank-zero-is-open-for-business/ [Accessed: 18 August 2021].

Businesstech. 2023. *Capitec now has 20 million customers*, *Busimesstech*. Available at: https://businesstech.co.za/news/banking/672261/capitec-now-has-20-million-customers/ [Accessed: 7 July 2023].

Cai, C.W. 2018. ‘Disruption of financial intermediation by fintech: a review on crowdfunding and blockchain’, *Accounting and Finance*, 58(4), pp. 965–992. Available at: https://doi.org/10.1111/acfi.12405.

Camarate, J. and Brinckmann, S. 2019. ‘The future of banking: A South African perspective’, *PwC South Africa: A marketplace without boundaries*, pp. 1–19. Available at: https://www.pwc.co.za/en/assets/pdf/strategyand-future-of-banking.pdf.

Campbell, D. and Frei, F. 2004. ‘The persistence of customer profitability: Empirical evidence and implications from a financial services firm’, *Journal of Service Research*, 7(2), pp. 107–123. Available at: https://doi.org/10.1177/1094670504268419.

Cao, Q. and Niu, X. 2019. ‘Integrating context-awareness and UTAUT to explain Alipay user adoption’, *International Journal of Industrial Ergonomics*, 69(October 2017), pp. 9–13. Available at: https://doi.org/10.1016/j.ergon.2018.09.004.

Carter, M. 1989. ‘Financial innovation and financial fragility’, *Journal of Economic Issues*, 23(3), pp. 779–793. Available at: http://www.jstor.org/stable/4226172.

Catalini, C. and Gans, J.S. 2020. ‘Some simple economics of the blockchain’, *Communications of the ACM*, 63(7), pp. 80–90. Available at: https://doi.org/10.1145/3359552.

Caton, J.L. 2019. ‘Cryptoliquidity: the blockchain and monetary stability’, *Journal of Entrepreneurship and Public Policy*, 9(2), pp. 227–252. Available at: https://doi.org/10.1108/JEPP-03-2019-0011.

Cennamo, C., Marchesi, C. and Meyer, T. 2020. ‘Two sides of the same coin? Decentralized versus proprietary blockchains and the performance of digital currencies.’, *Academy of Management Discoveries*, 6(3), pp. 382–405. Available at: https://doi.org/10.5465/amd.2019.0044.

CFA Institute Asia-Pacific Research Exchange 2017. ‘Disruptive Innovation in Financial Services’, in *Inaugural New Zealand Future of Finance Conference*. Available at: http://www.weforum.org/global-challenges/projects/disruptive-innovation-in-financial-services/.

Chan, K.H., Ng, T.H. and Ng, H.Y. 2020. ‘Are Malaysians ready for the cashless Society? Evidence from Malaysia’ s undergraduates’, *Global Business and Management Research: An International Journal*, 12(1), pp. 78–89. Available at: http://www.gbmrjournal.com/pdf/v12n1/V12N1-8.pdf.

Chao, C.M. 2019. ‘Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model’, *Frontiers in Psychology*, 10(JULY), pp. 1–14. Available at: https://doi.org/10.3389/fpsyg.2019.01652.

Charitou, C.D. and Markides, C.C. 2003. ‘Responses to disruptive strategic innovation’, *MIT Sloan Management Review*, pp. 1–11. https://doi.org/10.1371/journal.pone.0015090

Chatham, M. and Duncan, T. 2020. ‘Taxation as a barrier to blockchain innovation’, *SSRN Electronic Journal*, 5, pp. 3–23. Available at: https://doi.org/10.2139/ssrn.3662619.

Chen, M.A. and Robinson, J.M. 2019. ‘How valuable is Fintech innovation?’, *Oxford University Press on behalf of The Society for Financial Studies*, 32(5), pp. 2262–2106. Available at: https://doi.org/10.1093/rfs/hhy130.

Chen, S., D’Silva, D., Packer, F., and Tiwari, S. 2022. ‘Virtual banking and beyond’, *BIS Papers*, (120), pp. 1–38. Available at: http://www.bis.org/publ/bppdf/bispap120.pdf.

Chen, Z., Li, Y., Wu, Y., and Luo, J. 2017. 'The transition from traditional banking to mobile internet finance: an organizational innovation perspective - a comparative study of Citibank and ICBC', *Financial Innovation*, 3(1). Available at: https://doi.org/10.1186/s40854-017-0062-0.

Chikalipah, S. 2020. 'The pyrrhic victory of FinTech and its implications for achieving the Sustainable Development Goals: evidence from fieldwork in rural Zambia', *World Journal of Science, Technology and Sustainable Development*, 17(4), pp. 329–340. Available at: https://doi.org/10.1108/wjstsd-06-2020-0058.

Chironga, M., de Grandis, H. and Zouaoui, Y. 2017. 'Mobile financial services in Africa: Winning the battle for the customer', *Mckinsey Report*, (July), p. 6. Available at: https://www.mckinsey.com/industries/financial-services/our-insights/mobile-financial-services-in-africa-winning-the-battle-for-the-customer.

Chong, T. P., William Choo, K. S., Yip, Y. S., Chan, P. Y., Julian Teh, H. L., and Ng, S. S. 2019. 'An adoption of Fintech service in Malaysia', *South-East Asia Journal of Contemporary Business, Economics and Law*, 18(5), pp. 73–92.

Christensen, C., McDonald, R., Altman, E. J., and Palmer, J. 2017. Disruptive innovation: Intellectual history and future paths, Academy of Management Proceedings. Available at: https://doi.org/10.5465/ambpp.2017.14218abstract.

Christensen, C.M. 1993. 'The rigid disk drive industry: A history of commercial and technological turbulence', 67(Winter 1993), pp. 531–588. Available at: https://web.archive.org/web/20190503034223id_/https://www.cambridge.org/core/services/aop-cambridge-core/content/view/CF54257C79F0FC3F34D2A7104F640A84/S0007680500000088a.pdf/div-class-title-the-rigid-disk-drive-industry-a-history-of-commercial-and-technological-turbulence-div.pdf.

Christensen, C.M. 1997. *The innovator's dilemma: When new technologies cause great firms to fail*. Harvard Business School Press, Boston, Massachusetts.

Christensen, C.M. 2002. 'The opportunity and threat of disruptive technologies', *MRS Bulletin*, 27(4), pp. 278–282. Available at: https://doi.org/10.1557/mrs2002.81.

Christensen, C. M., Raynor, M. E., Rory, M., and McDonald, R. 2015. 'What is disruptive innovation', *Harvard Business Review*, 93(12), pp. 44–53. Available at: https://doi.org/10.1353/abr.2012.0147.

Christensen, C. M., Ojomo, E., Gay, G. D., and Auerswald, P. E. 2019. 'The third answer: How market-creating innovation drives economic growth and development', *Innovations: Technology, Governance, Globalization*, 12(3–4), pp. 10–26. Available at: https://doi.org/10.1162/inov_a_00272.

Christensen, C.M. and van Bever Derek, D. 2014. 'The capitalist's dilemma', *Harvard Business Review*. Boston, Massachusetts. Available at: https://digital.hbs.edu/platform-fgi/wp-content/uploads/sites/13/2017/03/The-Capitalist%E2%80%99s-Dilemma-reduced.pdf.

Christensen, C.M., Horn, M. and Staker, H. 2013. 'Is K-12 blended learning disruptive: An introduction of the theory of hybrids', *The Christensen Institute for Disruptive Innovation*, (May), pp. 1–48. Available at: http://www.christenseninstitute.org/wp-content/uploads/2013/05/Is-K-12-Blended-Learning-Disruptive.pdf.

Christensen, C.M. and Raynor, M.E. 2003. *The innovator's solution: Creating and sustaining successful growth*. Boston: Harvard Business School Press.

CIAT Inter-American Centre of Tax Administrations 2020. *Cryptocurrency Taxation: How to take a step forward*. Available at: https://www.ciat.org/cryptocurrency-taxation-how-to-take-a-step-forward/?lang=en#:~:text=USA – Cryptocurrency is treated as capital gains tax%5B18%5D. [Accessed: 7 February 2021].

Clark, T.H. and Lee, H.G. 1998. 'Security First Network Bank: A case study of an Internet pioneer', *Proceedings of the Hawaii International Conference on System Sciences*, 4(c), pp. 73–82. Available at: https://doi.org/10.1109/hicss.1998.655262.

Cliffe Dekker Hofmeyr 2020. Bridging the gap between fintech innovation and regulation: Is a local regulatory sandbox the answer? Available at: https://www.cliffedekkerhofmeyr.com/export/sites/cdh/news/publications/2020/technology/downloads/Technology-Media-Telecommunications-Alert-16-March-2020.pdf.

Coetzee, J. 2018. ‘Strategic implications of Fintech on South African retail banks’, *South African Journal of Economic and Management Sciences*, 21(1). Available at: https://doi.org/10.4102/sajems.v21i1.2455.

Coetzee, J. 2019. ‘Risk aversion and the adoption of Fintech by South African banks’, *African Journal of Business and Economic Research*, 14(4), pp. 133–153. Available at: https://doi.org/10.31920/1750-4562/2019/14n4a6.

Cong, L.W. and He, Z. 2019. ‘Blockchain disruption and smart contracts’, *Review of Financial Studies*, 32(5), pp. 1754–1797. Available at: https://doi.org/10.1093/rfs/hhz007.

Conti, M., Sandeep, K. E., Lal, C., and Ruj, S. 2018. ‘A survey on security and privacy issues of bitcoin’, *IEEE Communications Surveys and Tutorials*, 20(4), pp. 3416–3452. Available at: https://doi.org/10.1109/COMST.2018.2842460.

Cooper, D.R. and Schindler, P.S. 2014. *Business research methods*. Twelfth ed, *Proceedings of the Annual Reliability and Maintainability Symposium*. Twelfth ed. New: McGraw-Hill Irwin. Available at: https://doi.org/10.1109/arms.1991.154456.

Cortez, N. 2014. ‘Regulating disruptive innovation’, *Ssrn*, 29(1). Available at: https://doi.org/10.2139/ssrn.2436065.

Costello, A.B. and Osborne, J.W. 2005. ‘Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis’, *Practical Assessment, Research and Evaluation*, 10(7). Available at: https://www.researchgate.net/publication/209835856_Best_Practices_in_Exploratory_Factor_Analysis_Four_Recommendations_for_Getting_the_Most_From_Your_Analysis/link/580a4d4d08ae2cb3a5d3007c/download.

Cowling, N. 2023. *Banking ROE in South Africa 2013-*, *Statista*. Available at: https://www.statista.com/statistics/1348737/banks-return-on-equity-south-africa/ (Accessed: 2 October 2023).

Creswell, J.W. 2007. *Qualitative inquiry and research design: Choosing among five approaches*. Second, *SAGE Publications, Inc.* Second. London: SAGE Publications Ltd. Available at: https://doi.org/10.1177/1524839915580941.

Creswell, J.W. 2013. *Qualitative inquiry and research design*. 3rd edition. London: SAGE Publications Ltd.

Creswell, J.W. and Plano Clark, V.L. 2007. 'Introducing a mixed method design', in *Designing and conducting mixed methods research*. Thousand Oaks, CA: SAGE, pp. 58–89. Available at: https://www.sagepub.com/sites/default/files/upm-binaries/10982_Chapter_4.pdf.

Dahlberg, T., Mallat, N., Ondrus, J., and Zmijewska, A. 2008. 'Past, present and future of mobile payments research: A literature review', *Electronic Commerce Research and Applications*, 7(2), pp. 165–181. Available at: https://doi.org/10.1016/j.elerap.2007.02.001.

Dahlberg, T., Guo, J. and Ondrus, J. 2015. 'A critical review of mobile payment research', *Electronic Commerce Research and Applications*, 14(5), pp. 265–284. Available at: https://doi.org/10.1016/j.elerap.2015.07.006.

Daniel, E. 1999. 'Provision of electronic banking in the UK and the Republic of Ireland.', *International Journal of bank marketing*, 17(2), pp. 72–83. Available at: https://doi.org/10.1108/02652329910258934.

Das, S.R. 2019. 'The future of fintech', *Financial Management*, pp. 981–1007. Available at: https://doi.org/10.1111/fima.12297.

Davis, F.D. 1989. 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS Quarterly: Management Information Systems*, 13(3), pp. 319–339. Available at: https://doi.org/10.2307/249008.

Davis, K. and Maddock, R. 2017. 'Catching up with Indonesia's fintech industry', *Law and Financial Market Review*, 11(1), pp. 33–40. Available at: https://www.researchgate.net/publication/317836784_Catching_up_with_Indonesia's_fintech_industry/link/6179d1ca3c987366c3f4beed/download.

Deb, M. and Agrawal, A. 2017. 'Factors impacting the adoption of m-banking: understanding brand India's potential for financial inclusion', *Journal of Asia Business Studies*, 11(1), pp. 22–40. Available at: https://doi.org/10.1108/JABS-11-2015-0191.

Dečman, M. 2015. 'Modeling the acceptance of e-learning in mandatory environments of higher education: The influence of previous education and gender', *Computers in Human Behavior*, 49, pp. 272–281. Available at: https://doi.org/10.1016/j.chb.2015.03.022.

Deloitte. 2022. *The expanding role of non-banks in South Africa*. Available at: https://www2.deloitte.com/content/dam/Deloitte/za/Documents/financial-services/za-Non-bank-expansion-in-South-Africa.pdf [Accessed: 10 July 2022].

Denning, S. 2016. 'Christensen updates disruption theory', *Strategy & Leadership*, 44(2), pp. 10–16. Available at: https://doi.org/10.1108/sl-01-2016-0005.

Dhar, V. and Stein, R.M. 2017. 'Economic and business dimensions Fintech platforms and strategy', *Communications of the Association for Computing Machinery*, 60(10), pp. 32–35. Available at: https://doi.org/10.1145/3132726.

Didenko, A. 2018. 'Regulating Fintech: Lessons from Africa', *San Diego International Law Journal*, 2, pp. 311–369. Available at: https://doi.org/10.2139/ssrn.3135604.

Dirican, C. 2015. 'The impacts of robotics, artificial, intelligence on business and economics', *Procedia - Social and Behavioral Sciences*, 195, pp. 564–573. Available at: https://doi.org/10.1016/j.sbspro.2015.06.134.

Dolma, S. 2009. 'The central role of the unit of analysis concept in research design', *Istanbul Universitesi Isletme Fakultesi Dergisi*, 39(1), pp. 169–174. Available at: https://dergipark.org.tr/tr/download/article-file/98176.

Dranev, Y., Frolova, K. and Ochirova, E. 2019. 'The impact of fintech M&A on stock returns', *Research in International Business and Finance*, 48(September 2018), pp. 353–364. Available at: https://doi.org/10.1016/j.ribaf.2019.01.012.

Drasch, B.J., Schweizer, A. and Urbach, N. 2018. 'Integrating the "troublemakers": A taxonomy for cooperation between banks and fintechs', *Journal of Economics and Business*, 100(April), pp. 26–42. Available at: https://doi.org/10.1016/j.jeconbus.2018.04.002.

Dwolatzky, B. and Harris, M. 2020. 'The world is flat: Covid-19 becomes the driving force for 4IR', *University of Witwatersrand*, 1 June. Available at: https://www.wits.ac.za/covid19/covid19-news/latest/the-world-is-flat-covid-19-becomes-the-driving-force-for-4ir.html.

Edu, A.S. 2022. 'Positioning big data analytics capabilities towards financial service agility', *Aslib Journal of Information Management*, ahead-of-p(ahead-of-print). Available at: https://doi.org/10.1108/ajim-08-2021-0240.

Elia, G., Stefanelli, V. and Ferilli, G.B. 2022. 'Investigating the role of Fintech in the banking industry: what do we know?', *European Journal of Innovation Management* [Preprint]. Available at: https://doi.org/10.1108/ejim-12-2021-0608.

Elkatawneh, H. 2016. 'The five qualitative approaches- Problem, purpose, and questions / The role of theory in the five qualitative approaches comparative case study', *SSRN* [Preprint]. Available at: https://doi.org/http://dx.doi.org/10.2139/ssrn.2761327.

Elsaid, H.M. 2021. 'A review of literature directions regarding the impact of fintech firms on the banking industry', *Qualitative Research in Financial Markets* [Preprint], (2018). Available at: https://doi.org/10.1108/QRFM-10-2020-0197.

Enders, A., Jelassi, T., Koning, A., and Hungenberg, H. 2006. 'The relativity of disruption: E-banking as a sustaining innovation in the banking industry', *E-Commerce and V-Business: Digital Enterprise in the Twenty-First Century:* 2nd edition, 7(2), pp. 67–77. Available at: https://doi.org/10.4324/9780080549781.

Esmaeilian, B., Sarkis, J., Lewis, K., and Behdad, S. 2020. 'Blockchain for the future of sustainable supply chain management in Industry 4.0', *Resources, Conservation and Recycling*, 163(August), p. 105064. Available at: https://doi.org/10.1016/j.resconrec.2020.105064.

Eurosystem 2015. Technological innovation and the Dutch financial sector. Opportunities and risks for financial institutions, new market participants and supervision. Available at: https://dnb.nl/en/sector-news/technological-innovation-and-the-Dutch-financial -sector-Opportunities-and-risks-for-financial-institutions-new-market-participants-and-supervision.

Fenwick, M. and Vermeulen, E.P.M. 2017. How to respond to artificial intelligence in Fintech, Economy, Culture & History of Japan. Available at: https://research.tilburguniversity.edu/en/publications/how-to-respond-to-artificial-intelligence-in-fintech.

Filipiak, P. 2020. *COVID-19: The viral spread of cashless society?* Available at: https://www.ft.com/partnercontent/comarch/covid-19-the-viral-spread-of-cashless-society.html [Accessed: 25 January 2021].

Financial Sector Conduct Authority, S. (2022) *Policy document supporting the declaration of a crypto asset as a financial product under the Financial Advisory and Intermediary Services Act*. Pretoria. Available at: https://www.fsca.co.za/Regulatory Frameworks/Temp/Policy Document supporting the Declaration of crypto assets as a financial product.pdf.

Finlayson, J. and Peacock, K. 2021. 'COVID's creative destruction is cause for productivity optimism', *Business in Vancouver Insights*. Available at: https://biv.com/article/2021/01/covids-creative-destruction-cause-productivity-optimism.

Flavián, C., Pérez-Rueda, A., Belanche, D., and Casaló, L. V. 2021. 'Intention to use analytical artificial intelligence (AI) in services – the effect of technology readiness and awareness', *Journal of Service Management* [Preprint]. Available at: https://doi.org/10.1108/JOSM-10-2020-0378.

Fornell, C. and Larcker, D.F. 1981. 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, 18(1), pp. 39–50. Available at: https://scholar.google.com/scholar_url?url=https://www.researchgate.net/profile/Sandra-Abegglen-2/post/Hello_can_factor_loading_be_the_evidence_of_convergent_validity/attachment/59d633b279197b80779915ce/AS%253A375815574441984%2540466612823054/download/3151312.pdf&hl=en&sa=T&oi=gsb-gga&ct=res&cd=0&d=17136083877443099076&ei=zSwhZbSFLNi-y9YPhs6fmAU&scisig=AFWwaeaWYbFb4D5me9vefjfZLteP

Fourie, J. 2016. *How fintech must disrupt to be effective*, *Finweek*. Available at: www.fin24.com/finweek [Accessed: 12 September 2020].

Fox, S. and Do, T. 2013. 'Getting real about Big Data: applying critical realism to analyse Big Data hype', *International Journal of Managing Projects in Business*, 6(4), pp. 739–760. Available at: https://doi.org/10.1108/IJMPB-08-2012-0049.

Francis, J. J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. P., and Grimshaw, J. M. 2010. 'What is an adequate sample size? Operationalising data saturation for theory-based interview studies', *Psychology and Health*, 25(10), pp. 1229–1245. Available at: https://doi.org/10.1080/08870440903194015.

Friese, Susan, Soratto, J. 2018. ‘Carrying out a computer-aided thematic content analysis with ATLAS.ti’, *MMG Working Paper*, 18. Available at: https://www.researchgate.net/publication/324720405_Carrying_out_a_computer-aided_thematic_content_analysis_with_ATLASti/link/5af434a0aca2720af9c55af2/download.

FSB (Financial Stability Board) 2022. ‘Fintech and market structure in the COVID-19 pandemic: Implications for financial stability.’ Available at: www.fsb.org/emailalert.

Fung, D. W. H., Lee, W. Y., Yeh, J. J. H., and Yuen, F. L. 2020. ‘Friend or foe: The divergent effects of FinTech on financial stability’, *Emerging Markets Review*, (August), p. 100727. Available at: https://doi.org/10.1016/j.ememar.2020.100727.

Fusch, P.I. and Ness, L.R. 2015. ‘Are we there yet? Data saturation in qualitative research’, *Qualitative Report*, 20(9), pp. 1408–1416. Available at: https://nsuworks.nova.edu/tqr/vol20/iss9/3.

Galaski, R. 2015. ‘Digital disruption in financial services: The innovation imperative’, *FSI Review* [Preprint], (11). Available at: https://www2.deloitte.com/content/dam/Deloitte/sg/Documents/financial-services/sea-fsireview-issue11-noexp.pdf.

Garcia-Macia, D., Hsieh, C.-T. and Klenow, P.J. 2019. ‘How destructive is innovation?’, *Econometrica*, 87(5), pp. 1507–1541. Available at: https://doi.org/10.3982/ecta14930.

Gelis, P. and Woods, T. 2017. *The rise of fintech in finance*, *Kantox*. Available at: https://doi.org/10.1007/s12599-017-0464-6.

Gibson, J. 2015. The impact Fintech is having on the financial services industry in Ireland. Dublin Business School. Available at: https://esource.dbs.ie/bitstream/handle/10788/2906/mba_gibson_j_2015.pdf?sequence=1&isAllowed=y.

Gilbert, C. and Bower, J.L. 2002. ‘Disruptive change- When trying harder is part of the problem’, *Harvard Business Review*, pp. 95–102. Available at: https://hbr.org/2002/05/disruptive-change-when-trying-harder-is-part-of-the-problem.

Gist, M.E. and Mitchell, T.R. 1992. 'Self-efficacy: A theoretical analysis of its determinants and malleability', *Academy of Management Review*, 17(2), pp. 183–211. Available at: https://doi.org/10.2307/258770.

Goldstein, I., Jiang, W. and Karolyi, G.A. 2019. 'To Fintech and beyond', *Review of Financial Studies*, 32(5), pp. 1647–1661. Available at: https://doi.org/10.1093/rfs/hhz025.

Goles, T. and Hirschheim, R. 2000. 'The paradigm is dead', *The International Journal of Management Science*, 28, pp. 249–268. Available at: https://doi.org/10.1016/j.biocel.2004.12.003.

Gomber, P., Kauffman, R. J., Parker, C., and Weber, B. W. 2018. 'On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services', *Journal of Management Information System*, 35(1), pp. 220–265. Available at: https://doi.org/https://doi.org/10.1080/07421222.2018.1440766.

Gomber, P., Koch, J.A. and Siering, M. 2017. 'Digital finance and fintech: current research and future research directions', *Journal of Business Economics*, 87(5), pp. 537–580. Available at: https://doi.org/10.1007/s11573-017-0852-x.

Goodell, J.W. 2020. 'COVID-19 and finance: Agendas for future research', *Finance Research Letters*, 35(April). Available at: https://doi.org/10.1016/j.frl.2020.101512.

Greener, S. 2008. Business research methods. London: Dr Sue Greener & Ventus Publishing ApS.

Goyal, D., Varma, R., Rada, F., Pande, A., Jauregui, J., Corelli, P., Tripathi, S., Senant, Y., Dab, S., Erande, Y., Choi, J., Koserski, J., Carrubba, J., Morris, N., Rotman, F., Risley, M., and Suri, S. 2023. *Global fintech 2023: Reimagining the future of finance*. New York.

Gunawan, H., Sinaga, B.L. and WP, S.P. 2019. 'Assessment of the readiness of micro, small and medium enterprises in using E-money using the unified theory of acceptance and use of technology (UTAUT) method', *Procedia Computer Science*, 161, pp. 316–323. Available at: https://doi.org/10.1016/j.procs.2019.11.129.

Guo, J., Pan, J., Guo, J., Gu, F., and Kuusisto, J. 2019. 'Measurement framework for assessing disruptive innovations', *Technological Forecasting and Social Change*, 139(2019), pp. 250–265. Available at: https://doi.org/10.1016/j.techfore.2018.10.015.

Gupta, A. and Xia, C. 2018. A paradigm shift in banking: Unfolding Asia's fintech adventures, International Symposia in Economic Theory and Econometrics. Available at: https://doi.org/10.1108/S1571-038620180000025010.

Gupta, K. and Arora, N. 2019. 'Investigating consumer intention to accept mobile payment systems through unified theory of acceptance model: An Indian perspective', *South Asian Journal of Business Studies*, 9(1), pp. 88–114. Available at: https://doi.org/10.1108/SAJBS-03-2019-0037.

Gupta, K.P., Manrai, R. and Goel, U. 2019. 'Factors influencing adoption of payments banks by Indian customers: extending UTAUT with perceived credibility', *Journal of Asia Business Studies*, 13(2), pp. 173–195. Available at: https://doi.org/10.1108/JABS-07-2017-0111.

Hagaman, A.K. and Wutich, A. 2017. 'How many interviews are enough to identify metathemes in multisited and cross-cultural research? Another perspective on Guest, Bunce, and Johnson's (2006) Landmark Study', *Field Methods*, 29(1), pp. 23–41. Available at: https://doi.org/10.1177/1525822X16640447.

Hair, J., Black, W. C., Babin, B. J., A and Anderson, R. E. 2010. *Multivariate data analysis*. Seventh ed. New York: Pearson Prentice Hall.

Halili, S.H. and Sulaiman, H. 2019. 'Factors influencing the rural students' acceptance of using ICT for educational purposes', *Kasetsart Journal of Social Sciences*, 40(3), pp. 574–579. Available at: https://doi.org/10.1016/j.kjss.2017.12.022.

Hamel, G. and Prahalad, C.K. 1991. 'Corporate imagination and expeditionary marketing', *Harvard Business Review*, (July-August), pp. 81–92. Available at: https://0-web-s-ebscohost-com.oasis.unisa.ac.za/ehost/pdfviewer/pdfviewer?vid=1&sid=cbb0ed6e-9d1c-40ce-bc46-c6a6269fdf08%40redis.

Han, A.S. 2021. 'Chinese fintech companies and their "going out" strategies', *Journal of Internet and Digital Economics*, 1(1), pp. 47–63. Available at: https://doi.org/10.1108/jide-07-2021-0003.

Hashemi Joo, M., Nishikawa, Y. and Dandapani, K. 2019. 'Cryptocurrency, a successful application of blockchain technology', *Managerial Finance*, 46(6), pp. 715–733. Available at: https://doi.org/10.1108/MF-09-2018-0451.

Hatzkis, E.D., Nair, S.K. and Pinedo, M.L. 2010. 'Operations in financial services - An overview', *Production and Operations Management*, 19(6), pp. 633–664. Available at: https://doi.org/10.1111/j.1937-5956.2010.01163.x.

van der Have, R.P. and Rubalcaba, L. 2016. 'Social innovation research: An emerging area of innovation studies?', *Research Policy*, 45(9), pp. 1923–1935. Available at: https://doi.org/10.1016/j.respol.2016.06.010.

Hawkins, P. 2004. 'South Africa's financial sector ten years on: Performance since democracy', *Development Southern Africa*, 21(1), pp. 179–204. Available at: https://doi.org/10.1080/0376835042000181471.

Hay, L.J. 2020. *COVID-19: Could liquidity challenges be on the way for insurers?* Available at: https://blog.kpmg.lu/covid-19-could-liquidity-challenges-be-on-the-way-for-insurers/#:~:text=In the wake of Covid, adjustment expenses could be considerable. [Accessed: 25 January 2021].

Heilman, E., Kendler, A., Zohar, A., Hebrew, T., Israel, M. S. R., and Goldberg, S. 2015. 'Eclipse attacks on bitcoin's peer-to-peer network', in *24th USENIX Conference on Security Symposium*. Washington, D.C., pp. 129–144. Available at: https://www.usenix.org/node/190891.

Hitt, L.M. and Frei, F.X. 2002. 'Do better customers utilize electronic distribution channels? The case of PC banking', *Management Science*, 48(6), pp. 732–748. Available at: https://doi.org/10.1287/mnsc.48.6.732.188.

Ho, J.C. and Chen, H. 2018. 'Managing the disruptive and sustaining the disrupted: The case of Kodak and Fujifilm in the face of digital disruption', *Review of Policy Research*, 35(3), pp. 352–371. Available at: https://doi.org/10.1111/ropr.12278.

Holmes, C. and King, R. 2019. 'The evolution of business-to-business Fintech: What the future holds', *Journal of Payments Strategy and Systems*, 13(3), pp. 217–225. Available at: https://0-web-s-ebscohost-com.oasis.unisa.ac.za/ehost/pdfviewer/pdfviewer?vid=1&sid=29c733b1-0b78-4b42-afd3-9bbe0cbdd57c%40redis.

Hoque, R. and Sorwar, G. 2017. 'Understanding factors influencing the adoption of mHealth by the elderly: An extension of the UTAUT model', *International Journal of*

Medical Informatics, 101(May 2018), pp. 75–84. Available at: https://doi.org/10.1016/j.ijmedinf.2017.02.002.

Hornuf, L. and Haddad, C. 2019. 'The emergence of the global fintech market: Economic and technological determinants', *Small Business Economics*, 53, pp. 81–105. Available at: https://link.springer.com/article/10.1007/s11187-018-9991-x.

Hu, L.T. and Bentler, P.M. 1999. 'Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives', *Structural Equation Modeling*, 6(1), pp. 1–55. Available at: https://doi.org/10.1080/10705519909540118.

Hu, Z., Ding, S., Li, S., Chen, L., and Yang, S. 2019. 'Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model', *Symmetry*, 11(3). Available at: https://doi.org/10.3390/sym11030340.

Huei, C. T., Cheng, L. S., Seong, L. C., Khin, A. A., and Leh Bin, R. L. 2018. 'Preliminary study on consumer attitude towards fintech products and services in Malaysia', *International Journal of Engineering and Technology (UAE)*, 7(2), pp. 166–169. Available at: https://doi.org/10.14419/ijet.v7i2.29.13310.

Humbani, M. and Wiese, M. 2019. 'An integrated framework for the adoption and continuance intention to use mobile payment apps', *International Journal of Bank Marketing*, 37(2), pp. 646–664. Available at: https://doi.org/10.1108/IJBM-03-2018-0072.

Husserl, E. 1970. *Logical Investigations*. Edited by J. Bermudez, T. Crane, and P. Sulivan. London: Routledge. Available at: https://philpapers.org/archive/HUSLIV.pdf.

Hutton, M., Bhana, T., Allen, S., and Nursoo, U. 2019. *The SA Fintech in motion report*. Johannesburg. Available at: https://www.rmb.co.za/files/pdf/other/fintech-report.pdf.

Hwang, J. and Christensen, C.M. 2008. 'Disruptive innovation in health care delivery: A framework for business-model innovation', *Health Affairs*, 27(5), pp. 1329–1335. Available at: https://doi.org/10.1377/hlthaff.27.5.1329.

Im, I., Hong, S. and Kang, M.S. 2011. 'An international comparison of technology adoption: Testing the UTAUT model', *Information and Management*, 48(1), pp. 1–8. Available at: https://doi.org/10.1016/j.im.2010.09.001.

Inci, A.C. and Lagasse, R. 2019. 'Cryptocurrencies: applications and investment opportunities', *Journal of Capital Markets Studies*, 3(2), pp. 98–112. Available at: https://doi.org/10.1108/jcms-05-2019-0032.

International Monetary Fund 2018. 'The Bali Fintech Agenda: A blueprint for successfully harnessing Fintech's opportunities', (October). Available at: https://www.google.com/search?q=International+Monetary+Fund+2018.+%E2%80%98The+Bali+Fintech+Agenda%3A+A+blueprint+for+successfully+harnessing+Fintech%E2%80%99s+opportunities%E2%80%99%2C+(October).&rlz=1C1VDKB_enZA980ZA980&oq=International+Monetary+Fund+2018.+%E2%80%98The+Bali+Fintech+Agenda%3A+A+blueprint+for+successfully+harnessing+Fintech%E2%80%99s+opportunities%E2%80%99%2C+(October).&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBCDM3ODlqMWo0qAIAsAIA&sourceid=chrome&ie=UTF-8.

International Monetary Fund 2019 *IMF policy paper. Fintech: The experience so far*. Washington D.C. Available at: https://www.imf.org/en/Publications/Policy-Papers/Issues/2019/06/27/Fintech-The-Experience-So-Far-47056.

International Monetary Fund- African Department 2019. *FinTech in Sub-Saharan African Countries, Departmental Papers / Policy Papers*. Available at: https://doi.org/10.5089/9781484385661.087.

Jagtiani, J. and John, K. 2018. 'Fintech: The impact on consumers and regulatory responses', *Journal of Economics and Business*, 100, pp. 1–6. Available at: https://doi.org/10.1016/j.jeconbus.2018.11.002.

Jagtiani, J. and Lemieux, C. 2018. 'Do fintech lenders penetrate areas that are underserved by traditional banks?' *Journal of Economics and Business*, 100(February), pp. 43–54. Available at: https://doi.org/10.1016/j.jeconbus.2018.03.001.

Jang, J.-M. and Park, H. 2016 'Mobile Money in Sub-Saharan Africa and its Implications', *SSRN Electronic Journal*, 6(3). Available at: https://doi.org/10.2139/ssrn.2771541.

Jones, S. 1994. 'Origins, growth and concentration of bank capital in South Africa, 1860–92', *Business History*, 36(3), pp. 62–80. Available at: https://doi.org/10.1080/00076799400000075.

Jordan, M.I. and Mitchell, T.M. 2015. ‘Machine learning: Trends, perspectives, and prospects’, *Science*, 349, pp. 255–260. Available at: https://doi.org/DOI: 10.1126/science.aaa84.

Kaal, W.A. and Vermeulen, E.P.M. 2016. ‘How to regulate disruptive innovation - From facts to data’, *Ssrn*, pp. 169–209. Available at: https://doi.org/10.2139/ssrn.2808044.

Kabadayi, S., O’Connor, G.E. and Tuzovic, S. 2020. ‘Viewpoint: The impact of coronavirus on service ecosystems as service mega-disruptions’, *Journal of Services Marketing*, 34(6), pp. 809–817. Available at: https://doi.org/10.1108/JSM-03-2020-0090.

Kammerlander, N., König, A. and Richards, M. 2018. ‘Why do incumbents respond heterogeneously to disruptive innovations? The interplay of domain identity and role identity’, *Journal of Management Studies*, 55(7), pp. 1122–1165. Available at: https://doi.org/10.1111/joms.12345.

Kapron, Z. 2018. ‘From digital payments to digital finance: How China’s tech companies are redefining banking in Asia and soon Europe’, *Journal of Payments Strategy & Systems*, 12(1), pp. 68–73. Available at: https://hstalks.com/article/1877/from-digital-payments-to-digital-finance-how-china.

Karame, G.O. 2016. ‘On the security and scalability of Bitcoin’s blockchain’, in *2016 Conference on Computer and communications security*. Vienna, pp. 1861–1862. Available at: https://doi.org/10.1145/2976749.2976756.

Karame, Ghassan O, Androulaki, E. and Capkun, S. 2012. ‘Double-spending fast payments in Bitcoin’, in *2012 ACM conference on Computer and communications security*. Raleigh, pp. 906–917. Available at: https://dl.acm.org/doi/10.1145/2382196.2382292.

Karsen, M., Chandra, Y.U. and Juwitasary, H. 2019. ‘Technological factors of mobile payment: A systematic literature review’, *Procedia Computer Science*, 157, pp. 489–498. Available at: https://doi.org/10.1016/j.procs.2019.09.004.

Kells, S. 2020. ‘Impacts of COVID-19 on corporate governance and assurance, international finance and economics, and non-fiction book publishing: some personal reflections’, *Journal of Accounting and Organizational Change*, 16(4), pp. 629–635. Available at: https://doi.org/10.1108/JAOC-08-2020-0115.

Khan, S.N. 2014. ‘Qualitative research method - Phenomenology’, *Asian Social Science*, 10(21), pp. 298–310. Available at: https://doi.org/10.5539/ass.v10n21p298.

Kharas, H. and Dooley, M. 2020. ‘China’s influence on the global middle class’, *Global governance and norms*, (October), pp. 1–10. Available at: https://www.brookings.edu/articles/chinas-influence-on-the-global-middle-class/.

Khedmatgozar, H.R. and Shahnazi, A. 2018. ‘The role of dimensions of perceived risk in adoption of corporate internet banking by customers in Iran’, *Electronic Commerce Research*, 18(2), pp. 389–412. Available at: https://doi.org/10.1007/s10660-017-9253-z.

Kim, W.C. and Mauborgne, R. 2005. *Blue ocean strategy: How to create uncontested market space and make the competition irrelevant*. Boston, Massachusetts: Harvard Business School Press, Boston, Massachusetts. Available at: https://doi.org/10.15358/9783800656622.

Kim, Y., Park, Y.-J., Choi, J., and Yeon, J. 2015. ‘An empirical study on the adoption of “fintech” service: Focused on mobile payment services’, *Advanced Science and Technology Letters*, 114(Business 2015), pp. 136–140. Available at: https://doi.org/10.14257/astl.2015.114.26.

King, A.A. and Baatartogtokh, B. 2015. ‘How useful is the theory of disruptive innovation?’, *MIT Sloan Management Review*, 57(1), pp. 77–90. Available at: https://www.researchgate.net/publication/283877064_How_Useful_Is_the_Theory_of_Disruptive_Innovation/link/5be3418a299bf1124fc2dc7f/download.

King, B.A., Hammond, T. and Harrington, J. 2019. ‘Disruptive Technology: Economic Consequences of Artificial Intelligence and the Robotics Revolution’, *Journal of Strategic Innovation and Sustainability*, pp. 53–67. Available at: https://doi.org/10.33423/jsis.v12i2.801.

Kiran, M. and Stannett, M. 2014. ‘Bitcoin risk analysis’, *New Economic Models in the Digital Economy*, (165), pp. 1–28. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=94684492&site=ehost-live.

Klemz, B.R., Boshoff, C. and Mazibuko, N. 2006. ‘Emerging markets in Black South African townships: Small local independently owned versus large national retailers’,

European Journal of Marketing, 40(5/6), pp. 590–610. Available at: https:// DOI:10.1108/03090560610657859.

Komlos, J. 2016. 'Has creative destruction become more destructive?', *B.E. Journal of Economic Analysis and Policy*, 16(4). Available at: https://doi.org/10.1515/bejeap-2016-0179.

Koren, R., Prester, J., Buchmeister, B., and Palčič, I. 2016. 'Do organisational innovations have impact on launching new products on the market?', *Strojniski Vestnik/Journal of Mechanical Engineering*, 62(6), pp. 389–397. Available at: https://doi.org/10.5545/sv-jme.2016.3470.

Kornienko, A. A., Kornienko, A. v, Fofanov, O. B., and Chubik, M. P. 2015. 'Knowledge in artificial intelligence systems: Searching the strategies for application', *Procedia - Social and Behavioral Sciences*, 166, pp. 589–594. Available at: https://doi.org/10.1016/j.sbspro.2014.12.578.

Kothari, C.R. 2004. *Research Methodology - Methods and techniques*. 2nd edition. Daryaganj, New Delhi: New Age International (P) Ltd., Publishers.

Koufaris, M. and Hampton-Sosa, W. 2004. 'The development of initial trust in an online company by new customers', *Information and Management*, 41(3), pp. 377–397. Available at: https://doi.org/10.1016/j.im.2003.08.004.

KPMG 2022. *Pulse of fintech H2'21*. Available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2022/02/pulse-of-fintech-h2-21.pdf.

Krishnaswamy, K.N., Sivakumar, A.I.; and Mathirajan, M. 2006. *Management research methodology: Integration of principles, methods and techniques*. New Delhi: Pearson Education.

Krugman, P. 2007. 'Innovating our way to financial crisis', *The New York Times*. Available at: http://dx.doi.org/10.1016/j.cej.2014.10.020%0Ahttp://dx.doi.org/10.1016/j.apcatb.2013.08.019%0Ahttp://dx.doi.org/10.1016/j.tsf.2016.12.015%0Ahttps://ejournal.poltektegal.ac.id/index.php/siklus/article/view/298%0Ahttp://repositorio.unan.edu.ni/2986/1/5624.

Kumar, S. 2018. 'Understanding different issues of analysis in a business research', *Journal of General Management Research*, 5(2), pp. 70–82. Available at:

https://www.scmsnoida.ac.in/assets/pdf/journal/vol5Issue2/Article%206-%20Dr%20Sanjay%20Kumar.pdf.

Ky, S.S., Rugemintwari, C. and Sauviat, A. 2021. 'Friends or foes? Mobile money interaction with formal and informal finance', *Telecommunications Policy*, 45(1). Available at: https://doi.org/10.1016/j.telpol.2020.102057.

Laforet, S. and Li, X. 2005. 'Consumers' attitudes towards online and mobile banking in China', *International Journal of Bank Marketing*, 23(5), pp. 362–380. Available at: https://doi.org/10.1108/02652320510629250.

Lagarde, C. 2016. The role of emerging markets in a new global partnership for growth by IMF managing director Christine Lagarde, International Monetary Fund. Available at: https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp020416.

Lagoarde-Segot, T. and Leoni, P.L. 2013. 'Pandemics of the poor and banking stability', *Journal of Banking and Finance*, 37(11), pp. 4574–4583. Available at: https://doi.org/10.1016/j.jbankfin.2013.04.004.

Laidler, J. 2017. 'Does creative destruction really drive economic growth?', *National Bureau of Economic Research*, February. Available at: https://www.nber.org/digest/feb17/does-creative-destruction-really-drive-economic-growth.

Lake, R. 2020. *Mobile and online banking security during COVID-19: What you need to know*, *Forbes Advisor*. Available at: https://www.forbes.com/sites/advisor/2020/06/16/mobile-and-online-banking-security-during-covid-19-what-you-need-to-know/?sh=7c05af4b206c [Accessed: 20 February 2021].

Łasak, P. and Gancarczyk, M. 2021. 'Transforming the scope of the bank through fintechs: toward a modularized network governance', *Journal of Organizational Change Management* [Preprint]. Available at: https://doi.org/10.1108/JOCM-05-2021-0147.

Laukkanen, T. and Pasanen, M. 2008. 'Mobile banking innovators and early adopters: How they differ from other online users?', *Journal of Financial Services Marketing*, 13(2), pp. 86–94. Available at: https://doi.org/10.1057/palgrave.fsm.4760077.

Lee, A.S. 1991. ‘Integrating positivist and interpretive approaches to organizational research’, *Organization Science*, pp. 342–365. Available at: https://doi.org/10.1287/orsc.2.4.342.

Lee, I. and Shin, Y.J. 2018. ‘Fintech: Ecosystem, business models, investment decisions, and challenges’, *Business Horizons*, 61(1), pp. 35–46. Available at: https://doi.org/10.1016/j.bushor.2017.09.003.

Lee, M. S. Y., McGoldrick, P. J., Keeling, K. A., and Doherty, J. 2003. ‘Using ZMET to explore barriers to the adoption of 3G mobile banking services’, *International Journal of Retail & Distribution Management*, 31(6), pp. 340–348. Available at: https://doi.org/10.1108/09590550310476079.

Lenz, R. 2016. ‘Peer-to-peer lending: Opportunities and risks’, *European Journal of Risk Regulation*, 4, pp. 688–700. Available at: https://doi:10.1017/S1867299X00010126

Leong, C., Tan, B., Xiao, X., Tan, F. T. C., and Sun, Y. 2017. ‘Nurturing a fintech ecosystem: The case of a youth microloan startup in China’, *International Journal of Information Management*, 37(2), pp. 92–97. Available at: https://doi.org/10.1016/j.ijinfomgt.2016.11.006.

Lerner, J. and Tufano, P. 2011. The consequences of financial innovation: A counterfactual research agenda, Annual Review of Financial Economics. Available at: https://doi.org/10.1146/annurev.financial.050808.114326.

Lettice, F. and Thomond, P. 2002. ‘Disruptive innovation explored’, *Concurrent Engineering: Research and Applications*, (July), pp. 224–241. Available at: http://www.insightcentre.com/resources/DIExplored-CEConf2002final.pdf.

Leung, L. 2015. ‘Validity, reliability, and generalizability in qualitative research’, *Journal of Family Medicine and Primary Care*, 4(3), p. 324. Available at: https://doi.org/10.4103/2249-4863.161306.

Levitin, A.J. 2009. ‘The crisis without a face: Emerging narratives of the financial crisis’, *University of Miami Law Review*, 63(4). Available at: https://repository.law.miami.edu/umlr/vol63/iss4/2.

Levy, F. 2018. ‘Computers and populism: Artificial intelligence, jobs, and politics in the near term’, *Oxford Review of Economic Policy*, 34(3), pp. 393–417. Available at: https://doi.org/10.1093/oxrep/gry004.

Liébana-Cabanillas, F., Molinillo, S., and Ruiz-Montañez, M. 2020. ‘Assessment of mobile technology use in the emerging market: Analyzing intention to use m-payment services in India’, *Telecommunications Policy*, 44(9). Available at: https://doi.org/10.1016/j.telpol.2020.102009.

Liébana-Cabanillas, F., Molinillo, S. and Ruiz-Montañez, M. 2019. ‘To use or not to use, that is the question: Analysis of the determining factors for using NFC mobile payment systems in public transportation’, *Technological Forecasting and Social Change*, 139(November 2018), pp. 266–276. Available at: https://doi.org/10.1016/j.techfore.2018.11.012.

Lin, S., Yu, Y., Wu, C., and Wu, S.C. 2018. ‘The effects of internet banking on financial performance: Evidence from the East Asian countries’, *Journal of Accounting, Finance & Management Strategy*, 13(1), pp. 105–156. Available at: https://www.proquest.com/docview/2149601711?parentSessionId=zvXh2B7VNrcUfs8JBj6UEmnx4VCOLaJDEsVk5B2JZSY%3D&pq-origsite=summon&accountid=14648.

Lincoln, Y.S.; and Guba, E.G. 1985. *Naturalistic inquiry*. London: SAGE Publications Ltd.

Liu, J., Li, X. and Wang, S. 2020. ‘What have we learnt from 10 years of fintech research? A scientometric analysis’, *Technological Forecasting & Social Change*, 155(November 2019), p. 120022. Available at: https://doi.org/10.1016/j.techfore.2020.120022.

Lou, A.T.F. and Li, E.Y. 2017. ‘Integrating innovation diffusion theory and the technology acceptance model: The adoption of blockchain technology from business managers’ perspective’, *Proceedings of the International Conference on Electronic Business (ICEB)*, 2017-Decem, pp. 299–302.

de Luna, I. R., Liébana-Cabanillas, F., Sánchez-Fernández, J., and Muñoz-Leiva, F. 2019. ‘Mobile payment is not all the same: The adoption of mobile payment systems depending on the technology applied’, *Technological Forecasting and Social Change*, 146(October 2017), pp. 931–944. Available at: https://doi.org/10.1016/j.techfore.2018.09.018.

Maček, A., Murg, M. and Čič, Ž.V. 2020. 'How robotic process automation is revolutionizing the banking sector', in *Managing Customer Experiences in an Omnichannel World: Melody of Online and Offline Environments in the Customer Journey*, pp. 271–286. Available at: https://doi.org/10.1108/978-1-80043-388-520201020.

Madondo, S.M. 2015. 'Mixed methods research: An airplane without a blackbox', *General Educational Journal*, 4(September), pp. 68–75. Available at: https://www.academia.edu/18059214/Mixed_Methods_Research_An_Airplane_Without_a_Blackbox.

Magnuson, W. (2018) 'Regulating fintech', *Vanderbilt Law Review*, 71(4), pp. 1167–1226. Available at: https://scholarship.law.vanderbilt.edu/cgi/viewcontent.cgi?article=1033&context=vlr.

Manta, O. and Pop, N. 2017. 'The virtual currency and financial blockchain technology: Currency trends in digital finance', *Financial Studies*, 3, pp. 45–60. Available at: http://eds.a.ebscohost.com.ezproxy.javeriana.edu.co:2048/eds/pdfviewer/pdfviewer?vid=0&sid=cb17df37-bad3-4b19-99cb-e352cc49eb77%40sessionmgr4010.

Marshall, B., Cardon, P., Poddar, A., and Fontenot, R. 2013. 'Does sample size matter in qualitative research? A review of qualitative interviews in IS research', *Journal of Computer Information Systems*, 54(1), pp. 11–22. Available at: http://www.tandfonline.com/action/journalInformation?journalCode=ucis20%0Ahttp://dx.doi.org/10.1080/08874417.2013.11645667.

Marshall, G. and Jonker, L. 2011. 'An introduction to inferential statistics: A review and practical guide', *Radiography*, 17(1), pp. e1–e6. Available at: https://doi.org/10.1016/j.radi.2009.12.006.

Marx, K. and Engels, F. 2008. *The communist manifesto*. London: Pluto Press, 345 Archway Road, London N6 5AA.

Mas, F. D., Massaro, M., Verde, J. M., and Cobianchi, L. 2020. 'Can the blockchain lead to new sustainable business models?', *Journal of Business Models*, 8(2), pp. 31–38. Available at: https://doi.org/10.5278/ojs.jbm.v8i2.3825.

Maskey, S. 2018. *How artificial intelligence is helping financial institutions*, *Forbes Technology Council*. Available at:

https://www.forbes.com/sites/forbestechcouncil/2018/12/05/how-artificial-intelligence-is-helping-financial-institutions/#b32c11460a40 [Accessed: 20 September 2020].

Mason, B. 2021. *Bitcoin, Ethereum, and Ripple: The Differences*, *CNR-ISTI technical report*. Available at: https://www.fxempire.com/education/article/bitcoin-ethereum-and-ripple-the-differences-480465 [Accessed: 14 February 2021].

Mason, J. 2002. *Qualitative researching*. 2nd edition. London: SAGE Publications Ltd.

Mauborgne, R.A. and Kim, W.C. 1999. 'Creating new market space.', *Harvard business review*, 77(1), pp. 83–93. Available at: https://doi.org/10.1017/CBO9781107415324.004.

Mazambani, L. and Mutambara, E. 2019. 'Predicting fintech innovation adoption in South Africa: The case of cryptocurrency', *African Journal of Economic and Management Studies*, 11(1), pp. 30–50. Available at: https://doi.org/10.1108/AJEMS-04-2019-0152.

Mbama, C.I. and Ezepue, P.O. 2018. 'Digital banking, customer experience and bank financial performance: UK customers' perceptions', *International Journal of Bank Marketing*, 36(2), pp. 230–255. Available at: https://doi.org/10.1108/IJBM-11-2016-0181.

Mboweni, T.T. 2004. 'The South African banking sector - an overview of the past 10 years', in *Year-end media cocktail function*. Johannesburg: South African reserve Bank, pp. 1–7. Available at: https://www.bis.org/review/r041231f.pdf.

McIntosh, A.R. and Gonzalez-Lima, F. 1994. 'Structural equation modeling and its application to network analysis in functional brain imaging', *Human Brain Mapping*, 2(1–2), pp. 2–22.

Mckenzie, R., Mfongeh, G. N., Mohamed, S., Ncube, P., and Strauss, I. 2015. The South African financial system, Studies in Financial Systems. Available at: www.fessud.eu.

McMillan, J. 2005. 'Quantifying creative destruction: Entrepreneurship and productivity in New Zealand', *The Emergence of Entrepreneurial Economics Research on Technological Innovation, Management and Policy*, 9(05), pp. 189–210. Available at: https://doi.org/10.1016/S0737-1071(05)09011-6.

Miles, M.B. and Huberman, M.A. 1994. *Qualitative data analysis*. 2nd edition. London: SAGE Publications.

Miles, M.B., Huberman, M.A. and Saldana, J. 2014. *Qualitative data analysis. A methods sourcebook*. 3rd edition, *SAGE Publications, Inc.* 3rd edition. London: SAGE Publications.

Mishra, P.K. 2010. 'Financial innovation in financial markets - A reassessment', *SSRN*, p. 1533761. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1533761.

Miskam, S., Yaacob, A.M. and Rosman, R. 2019. 'Fintech and its impact on Islamic fund management in Malaysia: A legal viewpoint', in *Emerging Issues in Islamic Finance Law and Practice in Malaysia*. Emerald Publishing Limited, pp. 223–246. Available at: https://doi.org/10.1108/978-1-78973-545-120191019.

Mlambo, K. and Ncube, M. 2011. 'Competition and efficiency in the banking sector in South Africa', *African Development Review*, 23(1), pp. 4–15. Available at: https://doi.org/10.1111/j.1467-8268.2010.00268.x.

Mol, M.J. and Birkinshaw, J. 2009. 'The sources of management innovation: When firms introduce new management practices', *Journal of Business Research*, 62(12), pp. 1269–1280. Available at: https://doi.org/10.1016/j.jbusres.2009.01.001.

Mollick, E. 2014. 'The dynamics of crowdfunding: An exploratory study', *Journal of Business Venturing*, 29(1), pp. 1–16. Available at: https://doi.org/10.1016/j.jbusvent.2013.06.005.

Morse, J.M. 2000. 'Determining sample size', *Qualitative Health Research*, 10(1), pp. 3–5. Available at: https://doi.org/10.1177/104973200129118183.

Mpofu, R. and Nicolaides, A. 2019. 'Frankenstein and the fourth industrial revolution (4IR): Ethics and human rights considerations', *African Journal of Hospitality, Tourism and Leisure*, 8(5), pp. 1–25. Available at: https://www.ajhtl.com/uploads/7/1/6/3/7163688/article_71_vol_8_5__2019_unisa.pdf.

Mukherjee, A. and Nath, P. 2003. 'A model of trust in online relationship banking', *International Journal of Bank Marketing*, 21(1), pp. 5–15. Available at: https://doi.org/10.1108/02652320310457767.

Mungai, K. and Bayat, A. 2018. 'The impact of big data on the South African banking industry', in Proceedings of the International Conference on Intellectual Capital, Knowledge Management and Organisational Learning, ICICKM, pp. 225–236. Available at:

https://www.researchgate.net/publication/329468191_The_Impact_of_Big_Data_on_the_South_African_Banking_Industry/link/5c0a4db9a6fdcc494fdfdd7a/download.

Museba, T.J., Ranganai, E. and Gianfrate, G. 2021. 'Customer perception of adoption and use of digital financial services and mobile money services in Uganda', *Journal of Enterprising Communities*, 15(2), pp. 177–203. Available at: https://doi.org/10.1108/JEC-07-2020-0127.

Nagy, D., Schuessler, J. and Dubinsky, A. 2016. 'Defining and identifying disruptive innovations', *Industrial Marketing Management*, 57, pp. 119–126. Available at: https://doi.org/10.1016/j.indmarman.2015.11.017.

Najaf, K., Haj Khalifa, A., Obaid, S. M., Rashidi, A. al, and Ataya, A. 2022. 'Does sustainability matter for fintech firms? Evidence from United States firms', *Competitiveness Review: An International Business Journal*, ahead-of-p(ahead-of-print). Available at: https://doi.org/10.1108/cr-10-2021-0132.

Nakamoto, S. 2008. *Bitcoin: A peer-to-peer electronic cash system*. Available at: https://bitcoin.org/bitcoin.pdf [Accessed: 29 April 2019].

Nasdaq. 2023. *Bitcoin number of transactions, Nasdaq*. Available at: https://data.nasdaq.com/data/BCHAIN/NTRAN-bitcoin-number-of-transactions [Accessed: 17 July 2023].

Nejad, M.G. 2022. Research on financial innovations: an interdisciplinary review, International Journal of Bank Marketing, 40(3), pp. 578-612. Available at: https://doi.org/10.1108/ijbm-07-2021-0305.

Ng, A.W. and Kwok, B.K.B. 2017. 'Emergence of fintech and cybersecurity in a global financial centre: Strategic approach by a regulator', *Journal of Financial Regulation and Compliance*, 25(4), pp. 422–434. Available at: https://doi.org/10.1108/JFRC-01-2017-0013.

Nguyen, L., Tran, S. and Ho, T. 2021. 'Fintech credit, bank regulations and bank performance: a cross-country analysis', *Asia-Pacific Journal of Business Administration* [Preprint]. Available at: https://doi.org/10.1108/APJBA-05-2021-0196.

Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., and Agha, R. 2020. 'The socio-economic implications of the coronavirus pandemic (COVID-

19): A review', *International Journal of Surgery*, 78(April), pp. 185–193. Available at: https://doi.org/10.1016/j.ijsu.2020.04.018.

Nightingale, P. 2015. 'Schumpeter's theological roots? Harnack and the origins of creative destruction.', *Journal of Evolutionary Economics*, 25(1), pp. 69–75. Available at: https://doi.org/10.1007/s00191-014-0360-x.

Nikou, S.A. and Economides, A.A. 2017. 'Mobile-based assessment: Investigating the factors that influence behavioral intention to use', *Computers and Education*, 109, pp. 56–73. Available at: https://doi.org/10.1016/j.compedu.2017.02.005.

Nowell, L. S., Norris, J. M., White, D. E., and Moules, N. J. 2017. 'Thematic Analysis: Striving to Meet the Trustworthiness Criteria', *International Journal of Qualitative Methods*, 16(1), pp. 1–13. Available at: https://doi.org/10.1177/1609406917733847.

Oshodi, O., Molla, A., Karanasios, S., and Ong, C. E. 2017. 'Is FinTech a disruption or a new eco-system? An exploratory investigation of banks' response to FinTech in Australia', *Australasian Conference on Information Systems*, (December), pp. 1–11.

Paap, J. and Katz, R. 2004. 'Anticipating disruptive innovation', *Research Technology Management*, 47(5), pp. 13–22. Available at: https://doi.org/10.1080/08956308.2004.11671647.

Palandrani, P. 2019. *Fintech trends: M & A and mobile payments driving recent growth*. Available at: https://www.globalxetfs.com/fintech-trends-ma-and-mobile-payments-driving-recent-growth/.

Palmié, M., Wincent, J., Parida, V., and Caglar, U. 2020. 'The evolution of the financial technology ecosystem: An introduction and agenda for future research on disruptive innovations in ecosystems', *Technological Forecasting and Social Change*, 151(November 2019), p. 119779. Available at: https://doi.org/10.1016/j.techfore.2019.119779.

Patil, P., Tamilmani, K., Rana, N. P., and Raghavan, V. 2020. 'Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal', *International Journal of Information Management*, 54(February), p. 102144. Available at: https://doi.org/10.1016/j.ijinfomgt.2020.102144.

PDF.com 2021. *Top-5 banks in South Africa*. Available at: https://pdf.co/blog/biggest-banks-in-south-africa [Accessed: 16 February 2021].

Petrov, D. 2020. 'Blockchain ecosystem in the financial services industry.', *FAIMA Business & Management Journal*, 8(1), pp. 19–31. Available at: https://ezproxy.aud.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&AuthType=cookie,ip,url&db=bsu&AN=142588821&site=eds-live&scope=site.

Phonthanukitithaworn, C., Sellitto, C. and Fong, M.W.L. 2016. 'An investigation of mobile payment (m-payment) services in Thailand', *Asia-Pacific Journal of Business Administration*, 8(1), pp. 37–54. Available at: https://doi.org/10.1108/APJBA-10-2014-0119.

Polit, D.F. and Beck, C, T. 2010 'Generalization in quantitative and qualitative research: Myths and strategies', *International Journal of Nursing Studies*, 47(11), pp. 1451–1458. Available at: https://doi.org/10.1016/j.ijnurstu.2010.06.004.

Ponterotto, J.G. 2005. 'Qualitative research in counseling psychology: A primer on research paradigms and philosophy of science', *Journal of Counseling Psychology*, 52(2), pp. 126–136. Available at: https://doi.org/10.1037/0022-0167.52.2.126.

Pramanik, H.S., Kirtania, M. and Pani, A.K. 2019. 'Essence of digital transformation-Manifestations at large financial institutions from North America', *Future Generation Computer Systems*, 95, pp. 323–343. Available at: https://doi.org/10.1016/j.future.2018.12.003.

Price Waterhouse Coopers 2016. *Blurred lines: How fintech is shaping financial services*. Available at: https://www.pwc.de/de/newsletter/finanzdienstleistung/assets/insurance-inside-ausgabe-4-maerz-2016.pdf.

Queiroz, M.M. and Fosso Wamba, S. 2019. 'Blockchain adoption challenges in supply chain: An empirical investigation of the main drivers in India and the USA', *International Journal of Information Management*, 46(September 2018), pp. 70–82. Available at: https://doi.org/10.1016/j.ijinfomgt.2018.11.021.

Rahi, S. 2017. 'Research Design and Methods: A Systematic Review of Research Paradigms, Sampling Issues and Instruments Development', *International Journal of*

Economics & Management Sciences, 06(02). Available at: https://doi.org/10.4172/2162-6359.1000403.

Rahi, S., Abd. Ghani, M. and Ngah, A.H. 2019. 'Integration of unified theory of acceptance and use of technology in internet banking adoption setting: Evidence from Pakistan', *Technology in Society*, 58(February 2018), p. 101120. Available at: https://doi.org/10.1016/j.techsoc.2019.03.003.

de Reuver, M., Verschuur, E., Nikayin, F., Cerpa, N., and Bouwman, H. 2015. 'Electronic commerce research and applications collective action for mobile payment platforms: A case study on collaboration issues between banks and telecom operators', Electronic Commerce Research and Applications, 14(5), pp. 331–344. Available at: https://doi.org/10.1016/j.elerap.2014.08.004.

Ripple. 2020. *The future of CBDCs: Why all central banks must take action*. Available at: https://ripple.com/wp-content/uploads/2021/01/cbdc-wp-2020.pdf.

Ripple. 2021. *What is Ripple*, *Journal of Materials Processing Technology*. Available at: https://ripple.com/xrp/ [Accessed: 14 February 2021].

Roszkowska, P. 2021. 'Fintech in financial reporting and audit for fraud prevention and safeguarding equity investments', *Journal of Accounting and Organizational Change*, 17(2), pp. 164–196. Available at: https://doi.org/10.1108/JAOC-09-2019-0098.

SA History Online. 2020. *A history of Volkskas and the Absa Banking group*. Available at: https://www.sahistory.org.za/article/history-volkskas-and-absa-banking-group [Accessed: 21 May 2020].

Saal, M., Starnes, S. and Rehermann, T. 2017. 'Digital financial services: Challenges and opportunities for emerging market banks', *International Finance Corporation*, 24(August), p. 9. Available at: https://documents1.worldbank.org/curated/en/750421502949470705/pdf/118736-BRI-EMCompass-Note-42-DFS-Challenges-and-Opportunities-PUBLIC.pdf.

Saberi, S., Kouhizadeh, M., Sarkis, J., and Shen, L. 2019. 'Blockchain technology and its relationships to sustainable supply chain management', *International Journal of Production Research*, 57(7), pp. 2117–2135. Available at: https://doi.org/10.1080/00207543.2018.1533261.

Saksonova, S. and Kuzmina-Merlino, I. 2017. 'Fintech as financial innovation - The possibilities and problems of implementation', *European Research Studies Journal*, 20(3), pp. 961–973. Available at: https://www.ersj.eu/dmdocuments/2017-xx-3-a-66.pdf.

Sandeep, K. M., Maheshwari, V., Prabhu, J., Prasanna, M., Jayalakshmi, P., Suganya, P., and Benjula, A. M. 2020. 'Social economic impact of COVID-19 outbreak in India', *International Journal of Pervasive Computing and Communications*, 16(4), pp. 309–319. Available at: https://doi.org/10.1108/IJPCC-06-2020-0053.

Sandelowski, M. 1995. 'Sample size in qualitative research', *Research in Nursing and Health*, 18(2), pp. 179–183. Available at: https://doi.org/10.1002/nur.4770180211.

Sangwan, V., Harshita, Prakash, P., and Singh, S. 2019. 'Financial technology: a review of extant literature', *Studies in Economics and Finance*, 37(1), pp. 71–88. Available at: https://doi.org/10.1108/SEF-07-2019-0270.

Sarkar, S., Chauhan, S. and Khare, A. 2020. 'A meta-analysis of antecedents and consequences of trust in mobile commerce', *International Journal of Information Management*, 50(September 2019), pp. 286–301. Available at: https://doi.org/10.1016/j.ijinfomgt.2019.08.008.

Sathye, M. 2008. 'The impact of internet banking on performance and risk profile: Evidence from Australian credit unions', *Journal of Banking Regulation*, 6(2), pp. 163–174. Available at: https://doi.org/10.1057/palgrave.jbr.2340189.

Saunders, M., Lewis, P. and Thornhill, A. 2009. *Research methods for business students.* Fifth. Harlow: Pearson Education Limited. Available at: https://doi.org/10.1080/00223891.2010.528484.

Saunders, M., Lewis, P. and Thornhill, A. 2019. *Research methods for business students*. Eighth. Harlow: Pearson Education Limited. Available at: https://doi.org/10.1016/B978-0-08-044529-8.50007-0.

Savić, J. and Pešterac, A. 2019. 'Antecedents of mobile banking: UTAUT model', *The European Journal of Applied Economics*, pp. 20–29. Available at: https://doi.org/10.5937/ejae15-19381.

Schinckus, C. 2020. ‘The good, the bad and the ugly: An overview of the sustainability of blockchain technology’, *Energy Research and Social Science*, 69(May), p. 101614. Available at: https://doi.org/10.1016/j.erss.2020.101614.

Schumpeter, J.A. 1943. *Capitalism, socialism & deomocracy*. London: George Allen & Unwin (Publishers) Ltd. Available at: https://eet.pixel-online.org/files/etranslation/original/Schumpeter, Capitalism, Socialism and Democracy.pdf.

Schumpeter, J.A. 1950. ‘The process of creative destruction’, in *Capitalism, Socialism and Democracy*. 3rd edition. New York: Harper Torchbooks.

Seasongood, S. 2016. *Not just for the assembly line: A case for robotics in accounting and finance*, *Technology Accounting*. Available at: http://ksuweb.kennesaw.edu/~snorth/Robots/Articles/article4.pdf.

Senyo, P.K. and Osabutey, E.L.C. 2020. ‘Unearthing antecedents to financial inclusion through FinTech innovations’, *Technovation*, 98(June), p. 102155. Available at: https://doi.org/10.1016/j.technovation.2020.102155.

Shahabi, V., Azar, A., Faezy Razi, F., and Fallah Shams, M. F. 2020. ‘Simulation of the effect of COVID-19 outbreak on the development of branchless banking in Iran: case study of Resalat Qard–al-Hasan Bank’, *Review of Behavioral Finance* [Preprint]. Available at: https://doi.org/10.1108/RBF-06-2020-0123.

Sharma, P., Jindal, R. and Borah, M.D. 2020. ‘Blockchain Technology for Cloud Storage: A Systematic Literature Review’, *ACM Computing Surveys*, 53(4). Available at: https://doi.org/10.1145/3403954.

Sharma, R., Singh, G. and Sharma, S. 2020. ‘Modelling internet banking adoption in Fiji: A developing country perspective’, *International Journal of Information Management*, 53(June 2019), p. 102116. Available at: https://doi.org/10.1016/j.ijinfomgt.2020.102116.

Shi, D., Lee, T. and Maydeu-Olivares, A. 2019. ‘Understanding the model size effect on SEM fit indices’, *Educational and Psychological Measurement*, 79(2), pp. 310–334. Available at: https://doi.org/10.1177/0013164418783530.

Shin, D.H. 2009. 'Towards an understanding of the consumer acceptance of mobile wallet', *Computers in Human Behavior*, 25(6), pp. 1343–1354. Available at: https://doi.org/10.1016/j.chb.2009.06.001.

Si, S., Zahra, S. A., Wu, X., and Jeng, D. J. F. 2020. 'Disruptive innovation and entrepreneurship in emerging economics', *Journal of Engineering and Technology Management - JET-M*, 58(October), p. 101601. Available at: https://doi.org/10.1016/j.jengtecman.2020.101601.

Siau, K. and Wang, W. 2018. 'Building trust in artificial intelligence, machine learning, and robotics', *Cutter business technology journal*, 31(2), pp. 47–53. Available at: https://www.researchgate.net/profile/Keng-Siau-2/publication/324006061_Building_Trust_in_Artificial_Intelligence_Machine_Learning_and_Robotics/links/5ab8744baca2722b97cf9d33/Building-Trust-in-Artificial-Intelligence-Machine-Learning-and-Robotics.pdf

Singh, A.M. 2004. 'Trends in South African internet banking', *Aslib Proceedings*, 56(3), pp. 187–196. Available at: https://doi.org/10.1108/00012530410539368.

Singh, S., Sahni, M.M. and Kovid, R.K. 2020. 'What drives Fintech adoption? A multi-method evaluation using an adapted technology acceptance model', *Management Decision*, 58(8), pp. 1675–1697. Available at: https://doi.org/10.1108/MD-09-2019-1318.

Skoufias, E. 2003. 'Economic crises and natural disasters: Coping strategies and policy implications', *World Development*, 31(7), pp. 1087–1102. Available at: https://doi.org/10.1016/S0305-750X(03)00069-X.

Smith, D. 2013. *Phenomenology, The Stanford Encyclopedia of Philosophy*. Available at: https://plato.stanford.edu/archives/sum2018/entries/phenomenology/.

Sobh, R. and Perry, C. 2006. 'Research design and data analysis in realism research', *European Journal of Marketing*, 40(11–12), pp. 1194–1209. Available at: https://doi.org/10.1108/03090560610702777.

Solodan, K. 2019. 'Legal regulation of cryptocurrency taxation in European countries', *European Journal of Law and Public Administration*, 6(1), pp. 64–74. Available at: https://doi.org/10.18662/eljpa/64.

Sousa, F.J. 2010. 'Organizational Culture, Business-to-Business Relationships, and Interfirm Networks', in A.G. Woodside (ed.) *Advances in Business Marketing and Purchasing*. Emerald Group Publishing Ltd., pp. 455–503. Available at: https://doi.org/10.1108/S1069-0964(2010)0000016012.

South African Reserve Bank 2018a. 'Intergovernmental Fintech Working Group', in *Fintech workshop 19-20 April 2018*. Available at: https://www.resbank.co.za/Lists/News and Publications/Attachments/7718/01Full Quarterly Bulletin – March 2017.pdf.

South African Reserve Bank 2018b. *Media statement, Tuesday, 13 February 2018*. Available at: https://www.resbank.co.za/Lists/News and Publications/Attachments/8259/SARB FinTech release 13 February.pdf.

South African Reserve Bank 2020. *The national payment system framework and strategy: Vision 2025*. Pretoria. Available at: https://www.resbank.co.za/content/dam/sarb/what-we-do/payments-and-settlements/Vision 2025.pdf.

South African Revenue Service 2018. *SARS's stance on the tax treatment of cryptocurrencies*. Available at: http://www.sars.gov.za/Media/MediaReleases/Pages/6-April-2018---SARS-stance-on-the-tax-treatment-of-cryptocurrencies-.aspx [Accessed: 7 February 2021].

Sreelakshmi, C.C., and Sangeetha, K.P. 2020. 'Continuance adoption of mobile-based payments in Covid-19 context: an integrated framework of health belief model and expectation confirmation model', *International Journal of Pervasive Computing and Communications*, 16(4), pp. 351–369. Available at: https://doi.org/10.1108/IJPCC-06-2020-0069.

Statista. 2023. *Number of mobile payment transactions in China 2009-2022*. Available at: https://www-statista-com.esc-web.lib.cbs.dk/statistics/244538/number-of-mobile-payment-transactions-in-china/ [Accessed: 17 July 2023].

Statistics South Africa. 2023. *Quarterly Labour Force Survey, Quarterly Labour Force Survey*. Pretoria. Available at: http://www.statssa.gov.za/publications/P0211/P02111stQuarter2019.pdf.

Stoica, O., Mehdian, S. and Sargu, A. 2015. 'The impact of internet banking on the performance of Romanian banks: DEA and PCA approach', *Procedia Economics and*

Finance, 20(15), pp. 610–622. Available at: https://doi.org/10.1016/S2212-5671(15)00115-X.

Strydom, H. 2013. 'An evaluation of the purposes of research in social work', *Social Work (South Africa)*, 49(2), pp. 149–164. Available at: https://doi.org/10.15270/49-2-58.

Suoranta, M. and Mattila, M. 2004. 'Mobile banking and consumer behaviour: New insights into the diffusion pattern', *Journal of Financial Services Marketing*, 8(4), pp. 354–366. Available at: https://doi.org/10.1057/palgrave.fsm.4770132.

Szalay, E. 2020. *Risks of failure in $6.6tn forex market at record high, study shows*, *Financial Times*. Available at: https://www.ft.com/content/8587cb4b-faa8-4bb3-a775-b4edd90e4af5 [Accessed: 1 February 2021.

Szyjka, S. 2012. 'Understanding research paradigms: Trends in science education research.', *Problems of Education in the 21st Century*, 43, pp. 110–118. Available at: https://faculty.ksu.edu.sa/sites/default/files/understanding_research_paradigms.pdf.

Tabachnick, B.G. and Fidel, L.S. 2019. *Using multivariate statistics*. 7th edition. New York: Pearson. Available at: https://doi.org/10.4324/9781315181158-21.

Talwar, S., Dhir, A., Khalil, A., Mohan, G., and Islam, A. K. M. N. 2020. 'Point of adoption and beyond. Initial trust and mobile-payment continuation intention', *Journal of Retailing and Consumer Services*, 55, p. 102086. Available at: https://doi.org/10.1016/j.jretconser.2020.102086.

Tang, K.L., Ooi, C.K. and Chong, J.B. 2020. 'Perceived risk factors affect intention to use fintech', *Journal of Accounting and Finance in Emerging Economies*, 6(2), pp. 453–463. Available at: https://doi.org/10.26710/jafee.v6i2.1101.

Tang, T., Lin, H., Wang, Y., and Wang, Y. 2004. 'Toward an understanding of the behavioral intention to use mobile banking', in *Systems, Pacific Asia Conference on Information*, pp. 1660–1668. Available at: https://doi.org/10.1016/j.chb.2004.03.003.

Tavakol, M. and Dennick, R. 2011. 'Making sense of Cronbach's alpha', *International Journal of Medical Education*, 2, pp. 53–55. Available at: https://doi.org/10.5116/ijme.4dfb.8dfd.

van Teijlingen, E. and Hundley, V. 2002. 'The importance of pilot studies.', *Nursing standard (Royal College of Nursing (Great Britain): 1987)*, 16(40), pp. 33–36. Available at: https://doi.org/10.7748/ns2002.06.16.40.33.c3214.

Thakor, A. v. 2020. 'Fintech and banking: What do we know?', *Journal of Financial Intermediation*, 41(July 2019). Available at: https://doi.org/10.1016/j.jfi.2019.100833.

The Banker 2021. *Top 1000 world's banks 2021*. Available at: https://top1000worldbanks.com/africa/#group-section-2021-Results-lw57tJa5rr.

Thomas, H. and Hendrick-Wong, Y. 2019. 'How digital finance and fintech can improve financial inclusion', in *Inclusive Growth*, pp. 27–41. Available at: https://doi.org/10.1108/978-1-78973-779-020191004.

Thomond, Pete, Herzberg, Torsten and Lettice, F. 2003. 'Disruptive innovation: Removing the innovator's dilemma', in *Knowledge into Practice-British Academy of Management Annual Conference*. Harrogate, UK. Available at: http://www.insightcentre.com/resources/BAM2003forDisruptit.pdf.

Thwaits, C.R. 2016. Unicorns and fortresses: The barriers and enablers to effective fintech start-up collaboration with South African Banks, Molecular Biology. University of Pretoria. Available at: https://repository.up.ac.za/handle/2263/59788.

Tinsley, H.E.A. and Tinsley, D.J. 1987. 'Uses of Factor Analysis in Counseling Psychology Research', *Journal of Counseling Psychology*, 34(4), pp. 414–424. Available at: https://doi.org/10.1037/0022-0167.34.4.414.

Tracy, S.J. 2010. 'Qualitative quality: Eight "big-tent" criteria for excellent qualitative research', *Qualitative Inquiry*, 16(10), pp. 837–851. Available at: https://doi.org/10.1177/1077800410383121.

Transunion 2017. *2017 Annual report*. Available at: https://www.annualreports.com/HostedData/AnnualReportArchive/t/NYSE_TRU_2017.pdf.

Truong, O. 2016. *How fintech industry is changing the world*. Centria Univerity of Applied Sciences. Available at: http://opinto-opas-ops.tamk.fi/index.php/en/167/en/49598/16LITA/year/2016.

Tsindeliani, I. A., Proshunin, M. M., Sadovskaya, T. D., Popkova, Z. G., Davydova, M. A., and Babayan, O. A. 2022. 'Digital transformation of the banking system in the context of sustainable development', *Journal of Money Laundering Control*, 25(1), pp. 165–180. Available at: https://doi.org/10.1108/JMLC-02-2021-0011.

Turcan, R. V. and Deák, B. 2021. 'Fintech – stick or carrot – in innovating and transforming a financial ecosystem: toward a typology of comfort zoning', *Foresight* [Preprint], (October). Available at: https://doi.org/10.1108/FS-02-2021-0052.

Ul Haq, I., and Awan, T.M. 2020. 'Impact of e-banking service quality on e-loyalty in pandemic times through interplay of e-satisfaction', *Vilakshan - XIMB Journal of Management*, 17(1/2), pp. 39–55. Available at: https://doi.org/10.1108/xjm-07-2020-0039.

Vaismoradi, M., Turunen, H., and Bondas, T. 2013. 'Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study', *Nursing and Health Sciences*, 15, pp. 398–405. Available at: https://doi.org/10.1111/nhs.12048.

Varga, D. 2017. 'Fintech, the new era of financial services', *Budapest Management Review*, pp. 22–32. Availabe at: https://www.researchgate.net/publication/321208233_Fintech_the_new_era_of_financial_services/link/5b32555da6fdcc8506d0fe64/download.

Varma, J.R. 2019. 'Blockchain in Finance', *Vikalpa, The Journal for Decision Makers*, 44(1), pp. 1–11. Available at: https://doi.org/10.1177/0256090919839897.

Vasileiou, K., Barnett, J., Thorpe, S., and Young, T. 2018. 'Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period', *BMC Medical Research Methodology*, 18(1), pp. 1–18. Available at: https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/s12874-018-0594-7.

Vasiljeva, T. and Lukanova, K. 2016. 'Commercial banks and fintech companies in the digital transformation: Challenges for the future', *Journal of Business Management*, (11), pp. 25–33. Available at: https://nebulosa.icesi.edu.co/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=121217921&lang=es&site=eds-live&scope=site.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. 2003. 'User acceptance of information technology: Toward a unified view', *MIS Quarterly*, 27(3), pp. 425–478. Available at: https://doi.org/10.1201/9780849375477.ch230.

Venkatesh, V., and Davis, F.D. 2000. 'Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies', *Management Science*, 46(2), pp. 186–204. Available at: https://doi.org/10.1287/mnsc.46.2.186.11926.

Venkatesh, V., Thong, J.Y.L. and Xin, X. 2012. 'Consumer acceptance and use of information technology: Extending the Unified Theory of Technology Acceptance and Use of Technology', *MIS Quarterly*, 36(1), pp. 157–178. Available at: https://doi.org/10.1042/bst0120672.

Venkatesh, V., Thong, J.Y.L.; and Xu, X. 2013. 'Unified theory of acceptance and use of technology: A synthesis and the road ahead', *Journal of the Association for Information Systems*, 17(5), pp. 328–376. Available at: https://doi.org/10.17705/1jais.00428.

Verhoef, G. 2011. 'Concentration and competition: The changing landscape of the banking sector in South Africa 1970–2007', *South African Journal of Economic History*, 24(2), pp. 157–197. Available at: https://doi.org/10.1080/10113430909511222.

Wagner, M., Wyman, O., Sguerra, J., and Bertol, G. 2016. Harnessing the fintech revolution: How digital innovations are revitalizing MSME finance in Latin America and the Caribbean. Available at: https://www.oliverwyman.com/our-expertise/insights/2016/dec/harnessing-the-fintech-revolution.html.

Wall, L.D. 2018. 'Some financial regulatory implications of artificial intelligence', *Journal of Economics and Business*, 100(June), pp. 55–63. Available at: https://doi.org/10.1016/j.jeconbus.2018.05.003.

Wang, W. and Siau, K. 2019. 'Artificial intelligence, machine learning, automation, robotics, future of work and future of humanity: A review and research agenda', *Journal of Database Management*, 30(1), pp. 61–79. Available at: https://doi.org/10.4018/JDM.2019010104.

Wang, Z., GUAN, Z., Hou, F., Li, B., and Zhou, W. 2019. 'What determines customers' continuance intention of FinTech? Evidence from YuEbao', *Industrial Management and*

Data Systems, 119(8), pp. 1625–1637. Available at: https://doi.org/10.1108/IMDS-01-2019-0011.

WHO. 2021. *WHO Coronavirus Disease (COVID-19) Dashboard*. Available at: https://covid19.who.int/ [Accessed: 31 January 2021].

WHO. 2022. *WHO Coronavirus (COVID-19) Dashboard*. Available at: https://covid19.who.int/ [Accessed: 21 July 2022].

WHO. 2023. *WHO Coronavirus (COVID-19) dashboard*. Available at: https://covid19.who.int/ [Accessed: 13 July 2023].

Williams, M.D., Rana, N.P. and Dwivedi, Y.K. 2015. The unified theory of acceptance and use of technology (UTAUT): A literature review, Journal of Enterprise Information Management. Available at: https://doi.org/10.1108/JEIM-09-2014-0088.

Williamson, P. J., Wan, F., Eden, Y., and Linan, L. 2020. 'Is disruptive innovation in emerging economies different? Evidence from China', *Journal of Engineering and Technology Management - JET-M*, 57(November 2019). Available at: https://doi.org/10.1016/j.jengtecman.2020.101590.

Wilson, H.J., Daugherty, P.R. and Morini-Bianzino, N. 2017. 'The jobs that artificial intelligence will create', *MIT Sloan Management Review*, 58(4), pp. 14–16. Available at: https://doi.org/10.7551/mitpress/11645.003.0020.

Win, M., and Doyle, A.C. 2018. 'Data Analytics for the Insurance Industry: A Gold Mine', *The Journal of Insurance Institute of India*, (October-December), pp. 3–25. Available at: https://www.insuranceinstituteofindia.com/web/guest/the-journal.

Wójcik, D. and Ioannou, S. 2020. 'COVID-19 and Finance: Market Developments So Far and Potential Impacts on the Financial Sector and Centres', *Tijdschrift voor Economische en Sociale Geografie*, 111(3), pp. 387–400. Available at: https://doi.org/10.1111/tesg.12434.

Wolf, E. J., Harrington, K. M., Clark, S. L., and Miller, M. W. 2013. 'Sample Size Requirements for Structural Equation Models: An Evaluation of Power, Bias, and Solution Propriety', *Educational and Psychological Measurement*, 73(6), pp. 913–934. Available at: https://doi.org/10.1177/0013164413495237.

World Economic Forum 2016. ‘A Blueprint for digital identity: The role of financial institutions in building digital identity’, *World Economic Forum* [Preprint], (August). Available at: http://www3.weforum.org/docs/WEF_A_Blueprint_for_Digital_Identity.pdf.

World Economic Forum & Accenture 2017. *Digital transformation initiative: Professional services industry*. Geneva. Available at: https://www.weforum.org/reports/digital-transformation-of-industries/.

Wu, J.H. and Wang, S.C. 2005. ‘What drives mobile commerce? An empirical evaluation of the revised technology acceptance model’, *Information and Management*, 42(5), pp. 719–729. Available at: https://doi.org/10.1016/j.im.2004.07.001.

Xia, Q., Boateng Sifah, E., Asamoa, K. O., Gao, J., Du, X., and Guizani, M. 2017. ‘MeDShare: Trust-less medical data sharing among cloud service providers via blockchain’, *IEEE Access*, 5, pp. 1–10. Available at: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7990130.

Xu, D., Tang, S. and Guttman, D. 2019. ‘China’s campaign-style Internet finance governance: Causes, effects, and lessons learned for new information-based approaches to governance’, *Computer Law and Security Review*, 35(1), pp. 3–14. Available at: https://doi.org/10.1016/j.clsr.2018.11.002.

Yanagawa, E. 2018. ‘Digital transformation in Japan’s banking industry’, *Journal of Payments Strategy & Systems*, 12(4), pp. 351–364. Available at: https://hstalks.com/article/4987/digital-transformation-in-japans-banking-industry/.

Yanisky-Ravid, S. and Hallisey, S.K. 2019. ‘“Equality and privacy by design”: A new model of artificial intelligence data transparency via auditing, certification, and safe harbor regimes’, *Fordham URB. Law Journal*, 44, pp. 428–487. Available at: https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=2759&context=ulj.

Yeganeh, H. 2021. ‘Emerging social and business trends associated with the Covid-19 pandemic’, *Emerald Insight* [Preprint]. Available at: https://doi.org/10.1108/cpoib-05-2020-0066.

Yu, C.S. 2012. ‘Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model’, *Journal of Electronic Commerce Research*, 13(2), pp. 105–121. Available at: http://www.jecr.org/sites/default/files/13_3_p01_0.pdf.

Yu, T. and Shen, W. 2019. ‘Funds sharing regulation in the context of the sharing economy: Understanding the logic of China’s P2P lending regulation’, *Computer Law and Security Review*, 35(1), pp. 42–58. Available at: https://doi.org/10.1016/j.clsr.2018.10.001.

Zetzsche, D.A., Buckley, R.P. and Arner, D.W. 2017 ‘The distributed liability of distributed ledgers: Legal risks of blockchain’, *University of Illinois Law Review*, 4, pp. 1361–1406. Available at: https://doi.org/10.2139/ssrn.3018214.

Zhai, P., Ding, Y., Wu, X., Long, J., Zhong, Y., and Li, Y. 2020. ‘The epidemiology, diagnosis and treatment of COVID-19’, *International Journal of Antimicrobial Agents*, xxx(xxxx). Available at: https://doi.org/10.1016/j.ijantimicag.2020.105955.

Zhang, D., Hu, M. and Ji, Q. 2020. ‘Financial markets under the global pandemic of COVID-19’, *Finance Research Letters*, 36(April), p. 101528. Available at: https://doi.org/10.1016/j.frl.2020.101528.

Zhou, T., Lu, Y. and Wang, B. 2010. ‘Integrating TTF and UTAUT to explain mobile banking user adoption’, *Computers in Human Behavior*, 26(4), pp. 760–767. Available at: https://doi.org/10.1016/j.chb.2010.01.013.

Zhou, W., Arner, D.W. and Buckley, R.P. 2018. *Regulating FinTech in China: From Permissive to Balanced*. 1st edn, *Handbook of Blockchain, Digital Finance, and Inclusion*. 1st edn. Elsevier Inc. Available at: https://doi.org/10.1016/B978-0-12-812282-2.00003-6.

Zhou, Y., He, C. and Zhu, S. 2017. ‘Does creative destruction work for Chinese regions?’, *Growth and Change*, 48(3), pp. 274–296. Available at: https://doi.org/10.1111/grow.12168.

Zohrabi, M. 2013. ‘Mixed method research: Instruments, validity, reliability and reporting findings’, *Theory and Practice in Language Studies*, 3(2), pp. 254–262. Available at: https://doi.org/10.4304/tpls.3.2.254-262.

Zvirgzdina, R. and Skadina, H. 2019. ‘The effect of macroeconomic factors on business models in FinTech industry’, (49), pp. 260–268. Available at: https://doi.org/10.22616/esrd.2018.143.

Zwick, D. 2018. ‘No longer violent enough? Creative destruction, innovation and the ossification of neoliberal capitalism’, *Journal of Marketing Management*, 34(11–12), pp. 913–931. Available at: https://doi.org/10.1080/0267257X.2018.1536076.

APPENDICES

APPENDIX A: Consent letter

PARTICIPANT CONSENT FORM

I, _____, agree to be interviewed by Simphiwe Cele, a doctoral student at the University of South Africa. I understand that the conversation will be audio-recorded and it has been explained to me that this is to assist the researcher with accurate transcribing.

It has been explained to me that the content of our discussion will be kept confidential and that every precaution will be taken to safeguard my right to privacy.

I understand that my participation is voluntary and that I may withdraw at any time should I wish to do so. I have been assured that when the data has been analysed, the tape will be destroyed in order to protect my privacy and maintain my confidentiality. I have also been assured that my name will not be used, and this will facilitate my anonymity. I am aware that I may have access to the findings of this study on request. I also understand that I will not be compensated for my participation.

_____

Participant's signature Date:

Simphiwe Cele Date:

Researcher

APPENDIX B: Questionnaire for the customers

QUESTIONNAIRE

ADOPTION OF FINANCIAL TECHNOLOGIES (FINTECHS) IN SOUTH AFRICA

Please answer honestly. Any report or publication emanating from this work will not reflect personal identification information.

A. **Demographic information**

Gender	Male			Female			Other				
Do you have a bank account?	Yes	No		Name of bank							
Number of years having this account	Less than 1	1-3		4-6			7-10		More than 10		
Do you use any financial technology (fintech)	Yes	No		Name of the fintech							
Please select the fintech type(s). If you use more than one, please select all fintechs you use.	Digital-only bank (e.g., Tymebank, Discovery Bank)	Cryptocurrency (e.g., Bitcoin)		Mobile money (e.g., Samsung pay, Apple pay, Masterpass, PayPal)			Crowdlending/crowdfunding		Lending platform (e.g., Wonga)		Other
If your answer above is other, please list the fintech types (s).											
Number of years using fintech	Less than 1	1-3		4-6			7-10		More than 10		
Do you use a digital-only bank*?	Yes						No				
*A digital-only bank is a bank that provides banking facilities exclusively through digital platforms, such as mobile, tablets, and the Internet (e.g., Tymebank, Discovery Bank)											

Please indicate how much you agree with each of the following statements regarding digital banking and/or fintechs.

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

B. **Self-efficacy:** An individual's personal assessment and belief that he or she possesses the ability and skills to succeed when using digital banking/fintech (Shin, 2009; Chao, 2019).

Statements	**Rating**				
1. I do not think I would have difficulties using a mobile device to bank digitally.	1	2	3	4	5
2. I would adopt digital banking if it had a built-in guide for assistance.	1	2	3	4	5
3. I would adopt digital banking if someone showed me how to use it.	1	2	3	4	5
4. I would use digital banking to do my banking transactions.	1	2	3	4	5

C. **Perceived cost/value:** The level to which an individual thinks there will be a cost incurred for using digital banking/fintech (Huei, Chenh, Seong, Khin and Bin, 2018)

Statements	**Rating**				
5. I would have financial barriers (e.g., purchase of a compatible phone, airtime, and data expenses) in order to use digital banking	1	2	3	4	5
6. I would like to use digital banking if the banking fees are reasonable.	1	2	3	4	5
7. I believe I would have to put a lot of effort to obtain the information that would make me feel comfortable in adopting digital banking.	1	2	3	4	5

D. **Social influence:** The degree of the influence of others within the social environment (e.g., family, colleagues, and friends) and their beliefs on the use of digital banking/fintech (Dečman, 2015)

Statements	**Rating**				
8. People who are close to me could assist me in the use of digital banking.	1	2	3	4	5
9. If I were to adopt digital banking, I would be more admired among my peers than those who have not adopted it.	1	2	3	4	5
10. I would be trendy if I am using digital banking	1	2	3	4	5
11. People who are close or important to me think I should use digital banking	1	2	3	4	5
12. Many people around me are using digital banking.	1	2	3	4	5
13. People who influence my behavior think I should use digital banking.					
14. The mass media makes me use digital banking.	1	2	3	4	5
15. Having digital banking services is a status symbol in my environment.	1	2	3	4	5

E. E **Performance expectancy:** The functions and benefits that can be attained from the use of digital banking/fintech in terms of convenience, customization, accessibility, efficiency, time, and effort saving (Venkatesh et al., 2003)

Statements	**Rating**				
16. Using a digital bank can make my banking convenient.	1	2	3	4	5
17. Using a digital bank can make my banking efficient.	1	2	3	4	5
18. Digital banking is (would be) useful in my daily banking.	1	2	3	4	5
19. Digital banking would help me do banking more quickly and save time so I can do other activities.	1	2	3	4	5

F. **Perceived usefulness:** The degree to which an individual believes that using digital banking/fintech would enhance his or her performance (Davis, 1989)

Statements	**Rating**				
20. Digital banking decreases the time spent on banking activities.	1	2	3	4	5
21. Digital banking makes it easier to do banking transactions.	1	2	3	4	5
22. Digital banking makes banking while travelling ('banking on a go') easy.	1	2	3	4	5
23. Digital banking gives (would give) me greater control over my banking activities.	1	2	3	4	5
24. Digital banking would be useful for me.	1	2	3	4	5
25. Digital banking offers more advantages than branch banking.	1	2	3	4	5
26. Digital banking is a good substitute of branch banking	1	2	3	4	5

G. **Perceived ease of use:** The degree to which a person believes that using digital banking/fintech would be free of effort (Davis, 1989)

Statements	**Rating**				
27. Digital banking enables (would enable) me to complete transactions quickly.	1	2	3	4	5
28. Digital banking makes (would make) it easier for me to conduct banking transactions.	1	2	3	4	5
29. I can open an account online easily and quickly.	1	2	3	4	5

H. **Effort expectancy:** The degree of ease associated with the use of digital banking/fintech (Venkatesh et al., 2003).

Statements	**Rating**				
30. Learning how to use digital banking is easy for me.	1	2	3	4	5
31. My interaction with digital banking services is clear and understandable.	1	2	3	4	5
32. I find digital banking services easy to use.	1	2	3	4	5

I. **Facilitating conditions:** The degree to which an individual believes that (technical) infrastructure exists to enable him or her to use digital banking/fintech (Venkatesh et al., 2003).

Statements	**Rating**				
33. I have the resources necessary to use digital banking.	1	2	3	4	5
34. I have the knowledge necessary to use digital banking.	1	2	3	4	5
35. My mobile devices are compatible with digital banking.	1	2	3	4	5
36. I would like the digital banking platforms to suggest a customized path.	1	2	3	4	5
37. The cost of purchasing a mobile device suitable for digital banking is inhibitory (too high).	1	2	3	4	5
38. The cost of data prevents me from using digital banking.	1	2	3	4	5

J. **Ubiquity:** This means that an individual can use digital banking/fintech at any time and any place (Cao and Niu, 2019).

Statements	**Rating**				
39. Digital banking is more convenient than bank branch to conduct banking transactions.	1	2	3	4	5
40. Banking transactions done digitally would eliminate time constraints that I otherwise would have when I visited a branch, i.e. I can bank anytime.	1	2	3	4	5
41. Banking transactions done digitally would eliminate space constraints that I otherwise would have when I visited a branch, i.e. I can bank anywhere.	1	2	3	4	5

K. **Hedonic motivation:** The level of fun or pleasure an individual derives from using digital banking/fintech (Venkatesh et al., 2012).

Statements	**Rating**				
42. Using digital banking is (would be) fun.	1	2	3	4	5
43. Using digital banking is (would be) enjoyable.	1	2	3	4	5

Statements	Rating				
44. Using digital banking is (would be) exciting.	1	2	3	4	5

L. **Perceived risk:** The individual's thought and belief in the likelihood of having an adverse outcome and consequence in using digital banking/fintech (Khedmatgozar and Shahnazi, 2018)

Statements	Rating				
45. Using digital banking is potentially risk.	1	2	3	4	5
46. I don't (wouldn't) feel protected when providing personal information through a digital banking platform.	1	2	3	4	5
47. There is a high chance that something wrong would occur when using digital banking.	1	2	3	4	5
48. Conducting banking transactions on mobile devices is risky because one can easily lose or misplace the mobile device.	1	2	3	4	5
49. I fear that while I am making a transaction through digital banking, I might make mistakes since the correctness of the inputted information is difficult to check from the mobile phone screen.	1	2	3	4	5
50. I am happy with how digital banking platforms verify users' identity for security purposes.	1	2	3	4	5

M. **Perceived trust:** The extent to which an individual believes that digital banking/fintech is reliable and safe to adopt (Al-Saedi, Al-Emran, Ramayah and Abushamet, 2020)

Statements	Rating				
51. I believe that all the transactions data are confidential.	1	2	3	4	5
52. I believe that I would get an immediate confirmation message when the transaction is completed.	1	2	3	4	5
53. I expect digital banking to be reliable.	1	2	3	4	5
54. I do not trust the functionality of digital banking.	1	2	3	4	5
55. I have serious doubts that the banking transactions performed digitally will work satisfactorily	1	2	3	4	5
56. The transactions done via digital banking are accurate	1	2	3	4	5
57. My transaction data are protected when I am using digital banking.	1	2	3	4	5

N. **General comments:**

58. Any comments and/or suggestions to improve the adoption of digital banking in South Africa

Thank you for your time.

APPENDIX C: Questionnaire for the industry experts

QUESTIONNAIRE

THE IMPACT OF FINANCIAL TECHNOLOGIES ON THE SOUTH AFRICAN FINANCIAL SERVICES INDUSTRY

Please answer honestly. Any report or publication emanating from this work will not reflect personal identification information.

O. **Demographic information**

Gender	Male		Female		Other		
I work for a……	Traditional bank	Digital-only bank		Mobile payment/ payment fintech		Regulatory institution	
Number of years working for this institution	Less than 1	1-3	4-6		7-10		More than 10

Please indicate how much you agree with each of the following statements regarding digital banking and fintechs.

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

P. **Impact of financial technologies in the financial services industry**

Statements	**Rating**				
1. Fintechs are having a positive effect on the financial services industry.	1	2	3	4	5
2. Fintechs affect the business of the incumbents negatively.	1	2	3	4	5
3. Fintechs bring regulatory challenges.	1	2	3	4	5
4. Fintechs bring challenges for the incumbents.	1	2	3	4	5
5. Fintechs bring benefits for the customers in the financial services industry.	1	2	3	4	5
6. Financial technologies present the financial services industry with new economic growth opportunities.	1	2	3	4	5
7. Fintechs will affect the financial services industry in a similar way that online retailers like Amazon, take a Lot and Uber have affected the retail and the taxi industry, respectively.	1	2	3	4	5
8. The customers in South Africa are ready for fintechs like branchless banks.	1	2	3	4	5

Statements	Rating				
9. South Africa's fintechs are on the same standard as their international counterparts	1	2	3	4	5

Q. **This section is for the incumbents' employees only.**

How do traditional (incumbents) financial institutions respond to fintech disruptions?

Statements	Rating				
10. My organisation is responding adequately to fintech disruption.	1	2	3	4	5
11. My organisation's response strategy is adequate to survive the disruption and remain competitive.	1	2	3	4	5
12. Fintechs will displace the incumbent institutions in the future.	1	2	3	4	5

R. **How do regulators respond to fintech disruptions?**

13. Regulatory is doing enough to regulate fintech and ensure consumer safety from things like cybersecurity.	1	2	3	4	5
14. South Africa's financial services regulations are ready for the fintech	1	2	3	4	5
15. Fintech regulations in South Africa are aligned with the international standards	1	2	3	4	5

S. **Effects of COVID-19**

Statements	Rating				
16. The COVID 19 pandemic has affected the financial services industry negatively.	1	2	3	4	5
17. COVID 19 has fast-tracked the adoption of fintechs.	1	2	3	4	5
18. Things will go back to the old normal once the pandemic is over.	1	2	3	4	5

Thank you for your time.

APPENDIX D: Interview questions for Incumbents' experts

INTERVIEW QUESTIONS

RQ1: What is the impact of technological innovations in the financial services industry?

Sub questions:

1. Tell me about the way fintechs affect the industry, the business of the incumbents and regulation.
2. Do you think financial technologies present the financial services industry with new economic growth opportunities?
3. Tell me about the challenges that fintechs bring to the financial services industry.
4. Tell me about the benefits that fintechs bring to the financial services industry.
5. Do you think fintechs will affect the FS industry in a similar way that online retailers like Amazon and Take-a-lot have affected the retail industry and Uber in the taxi industry?
6. Which fintechs do you think are transforming the industry significantly?
7. Do you think SA fintechs are on the same standard as their international counterparts?

RQ2: How do traditional financial institutions and regulators respond to fintech disruptions in South Africa?

How do traditional (incumbents) financial institutions respond to fintech disruptions?

Sub questions:

1. How is your organisation responding to fintech disruption?
2. Do you think that your organisation's response strategy is adequate to survive the disruption and remain competitive?
3. If you were to advise the new entrants (fintechs) what kind of advice would you give them to be successful?
4. Do you think fintechs will displace the incumbent FS institutions?

How do regulators respond to fintech disruptions?

Sub questions:

1. How is regulation changing to accommodate fintech disruptions?

2. How do regulators respond to the disruption by fintechs in the FS industry?
3. Do you think the regulators are doing enough to regulate fintech and ensure consumer safety from things like cybersecurity?
4. Do you think SA's financial services regulations are ready for the fintechs?
5. Are the fintech regulations in SA aligned with international standards?
6. If you were to advise the regulators regarding fintech regulation, what kind of advice would you give them?

RQ3: What are the factors that influence customers to use fintechs in South Africa?

Sub question:

1. Do you think the customers in SA are ready for fintechs like branchless banks, cryptocurrency, mobile money, and crowdlending/funding?

RQ5: Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

Sub question:

1. At the beginning of 2020, the world was affected by the COVID-19 pandemic, which has affected every aspect of our lives. Tell me about the impact of the COVID-19 pandemic on the financial services industry.
    a. Tell me about the relationship between COVID-19 and fintech if there is any.
2. How has the pandemic affected your organisation?
3. How is your organisation responding to the COVID-19 pandemic?
4. Do you think things will go back to the old normal once the pandemic is over?

APPENDIX E: Interview questions for regulators' experts

INTERVIEW QUESTIONS

RQ1: What is the impact of technological innovations in the financial services industry?

Sub questions:

1. Tell me about how fintechs affect the industry, the incumbents' business, and regulation.
2. Do you think financial technologies present the financial services industry with new economic growth opportunities?
3. Tell me about the challenges that fintechs bring to the FS industry.
4. Tell me about the benefits that fintechs bring to the FS industry.
5. Do you think fintechs will affect the FS industry similarly to online retailers like Amazon, Take-a-Lot, and Uber have affected the retail industry and the taxi industry, respectively?
6. Which fintechs do you think are transforming the industry significantly?
7. Do you think the customers in SA are ready for fintechs like branchless banks, cryptocurrency, mobile money, and crowdlending/funding?
8. Do you think SA fintechs are on the same standard as their international counterparts?

RQ2: How do traditional financial institutions and regulators respond to fintech disruptions in South Africa?

How do traditional (incumbents) financial institutions respond to fintech disruptions?

Sub questions:

1. How is your organisation responding to the fintech disruption?
2. Do you think your organisation's response strategy is adequate to survive the disruption and remain competitive?
3. If you were to advise the new entrants (fintechs), what kind of advice would you give them to be successful?
4. Do you think fintechs will displace the incumbent FS institutions?

How do regulators respond to fintech disruptions?

Sub questions:

1. Tell me about how regulations are changing to accommodate fintech disruptions?
2. Do you think SA's financial services regulations are ready for the fintechs?

3. Are the fintech regulations in SA aligned with international standards?
4. Fintechs pose risks like cybersecurity and terrorism financing to the financial services industry. What provisions are regulators putting in place to curb this risk?
5. Do you think the regulators are doing enough to regulate fintech and ensure consumer safety from things like cybersecurity?
6. If you were to advise the new entrants (fintechs), what kind of advice would you give them regarding regulation?

RQ3: What are the factors that influence customers to use fintechs in South Africa?

Sub question:

1. Do you think the customers in SA are ready for fintechs like branchless banks, cryptocurrency, mobile money, and crowdlending/funding?

RQ5: Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

Sub questions:

1. At the beginning of 2020, the world was affected by the COVID-19 pandemic, affecting every aspect of our lives. Tell me about the impact of the COVID-19 pandemic on the financial services industry.
2. Tell me about the relationship between COVID-19 and fintech if there is any.
3. Has the COVID-19 pandemic fast-tracked the adoption of fintechs?
4. Do you think things will return to the old normal once the pandemic is over?

APPENDIX F: Interview questions for customers

INTERVIEW QUESTIONS

RQ1: What is the impact of technological innovations in the financial services industry?

Sub questions:

1. Do you think financial technologies present the financial services industry with new economic growth opportunities?
2. What benefits are fintechs bringing to the FS industry?
3. What challenges are the fintechs bringing to the FS industry?
4. Do you think fintechs will affect the FS industry similarly to that online retailer like Amazon, Take-a-Lot and Uber have affected the retail and taxi industries, respectively?
5. Which fintechs do you think are transforming the industry significantly?

RQ2: How do traditional financial institutions and regulators respond to fintech disruptions?

Sub questions:

1. Do you think the regulators are doing enough to regulate fintech and ensure consumer safety, e.g., cryptocurrencies?
2. If you were to advise the new entrants (fintechs), what advice would you give them to become successful and more competitive?
3. If you were to advise the regulators, what kind of advice would you give them regarding regulating fintechs?

RQ3: What are the factors that influence customers to use fintechs in South Africa?

Sub questions:

1. What is your favourite financial technology? Why?
2. Do you use fintechs in your daily life?
3. Do you think the customers in SA are ready for fintechs like branchless banks, cryptocurrency, mobile money, and crowdlending/funding?
4. Are you comfortable using financial technologies like digital-only banks, mobile payments/money, cryptocurrencies, and crowdlending/funding platforms? Why?

5. Have you encountered any difficulties when transacting using financial technology?
6. How do you think the transaction through financial technology in the future will be?

RQ5: Has the COVID-19 pandemic impacted the adoption of fintechs in South Africa?

Sub questions:

1. Do you think the pandemic has accelerated the adoption of financial technologies?
2. Do you think people will return to the old ways when the pandemic is over?

APPENDIX G: UNISA Ethical clearance

University of South Africa, PO Box 392, Unisa, 0003, South Africa
Cnr Janadel and Alexandra Avenues, Midrand, 1685, Tel: +27 11 652 0000, Fax: +27 11 652 0299
E-mail: sbl@unisa.ac.za Website: www.unisa.ac.za/sbl

SCHOOL OF BUSINESS LEADERSHIP

RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

19 October 2021

Ref #: 2021_SBL_DBL_016_FA
Name of applicant: Mr S Cele
Student #: 57647577

Dear Mr Cele

Decision: Ethics Approval

Student: Mr S Cele, (57647577@mylife.unisa.ac.za , 071 332 1025)

Supervisor: Prof V Gumede, (Vusi.Gumede@ump.ac.za , 082 336 7462)

Project Title: Financial technologies and disruptive innovation in financial services in an emerging economy: The case of South Africa.

Qualification: Doctor of Business Leadership (DBL)

Expiry Date: September 2023

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee: Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 14/10/2021.

The proposed research may now commence with the proviso that:

1) The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached
2) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.
4) An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
5) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

45 Building leaders who go beyond

SBL GRADUATE SCHOOL OF BUSINESS LEADERSHIP UNISA

APPENDIX H: Turnitin report

Submission FINAL THESIS 57647577 Cele

ORIGINALITY REPORT

22%	18%	17%	8%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	bura.brunel.ac.uk Internet Source	1%
2	vital.seals.ac.za:8080 Internet Source	1%
3	uir.unisa.ac.za Internet Source	1%
4	hdl.handle.net Internet Source	1%
5	Submitted to Heriot-Watt University Student Paper	<1%
6	ebin.pub Internet Source	<1%
7	Submitted to City University of Hong Kong Student Paper	<1%
8	glasgow.rl.talis.com Internet Source	<1%
9	commerce.nwu.ac.za Internet Source	<1%

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off