Customer Adoption of Mobile Fintech in the South African Middle Income Market

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ABSTRACT

The financial industry level changes are adaptations to changes already taking place at a consumer level. Consumer behaviours are changing owing to the centrality of digital products accessed on mobile phones. Therefore, consumer lives are increasingly being digitally transformed. This study sought to chart both industry and consumer changes that are taking place in the middle income market of South Africa.

This middle income market is highly banked and likely to be on the 'right side of the digital divide' in terms of high accessibility to digital products and services. However, this customer market's digital transformation journey has not filtered down as much into individuals' financial lives as into their social lives. As a result, this study explored factors that contribute to the customer adoption of mobile fintech in this market.

A mixed methodology was employed, where multiple methods were used to firstly examine both positive facilitators and negative barriers to the customer adoption of mobile fintech in the middle income market. The top positive factors were found to be facilitators such as attitude, behavioural intention, and customer needs (utilitarian factors). The only found negative factor was the barrier of self-efficacy. Moreover, additional factors, outside of the found barriers and facilitators, further explained the nature of customer adoption for this context. Secondly, the middle income market's digitally transforming behaviours were explored and found to be ungeneralisable due to nuances according to the various income and digital profile segments.

As the middle income market is found to be an under-researched area when compared to underbanked and unbanked markets, this study clarifies the nature of this market at this time. It is a diverse customer segment that requires strategic enablers from fintechs, incumbent banks and government players if it is to show an accelerated curve in the adoption of mobile fintech.

KEY WORDS

Customer Adoption, Consumer Behaviour, Fintech, Mobile Financial Technology, Digital Transformation, Technology Acceptance, Middle Income Market

DECLARATION

I, Penelope Lucy Jacobs, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: P.L. Jacobs **Signature:** 

Signed at: Johannesburg

On the 27 September **day of** 2021

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CX: Customer Experience

DT: Digital Transformation

Fintech: Financial Technology

Insurtech: Insurance Technology

P2P: Peer to Peer

SEM: Structural Equation Modelling

TAM: Technology Acceptance Model

USSD: Unstructured Supplementary Service Data

UTAUT: Unified Theory of Acceptance and Use of Technology

UTAUT-TAM: Unified Theory of Acceptance and Use of Technology-Technology Acceptance Model

UX: User Experience

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

This study used a mixed-methods approach and explored the factors contributing to the adoption of mobile fintech by customers in the South African middle income market.

1.2 Context of the study

Emerging digital products and services such as Financial Technology (fintech), Internet of Things (IOT) and Electric Vehicles (EV) are progressively moving from peripheral use and into mainstream mass consumption. Naturally, consumer appetites are growing simultaneously, in their demands for the convenience digital products and services give (PricewaterhouseCoopers, 2016). The growing consumption of these products and services is also transforming consumer behaviour, making it more digital. Therefore, such meta-industry changes require an enquiry into the factors that propel consumer behaviour within an emerging market like South Africa's forward into becoming a digitally transformed society.

The financial services sector is an integral industry in the meta (country-wide) and micro (organisational) programme of digital transformation, particularly because the banking segment is considered one of South Africa's most digitally enabled industries (Jenkin & Naude, 2019), along with insurance, media and ICT industries. All four of these industries are ranked amongst the highest monetary contributors to the economy – in billions – as well as being identified as industries most likely to be technologically disrupted in the near future (Armstrong, 2019). This contextual dynamic, particularly with relation to banking, forces the five incumbent banks, i.e. Absa Bank, First National Bank (FNB), Standard Bank, Nedbank and Capitec to be consistent in their drive to innovate and accelerate high levels of digital technology adoption, in both their internal make-up and in their external offerings before such anticipated disruption occurs in form of fintechs (Rand Merchant Bank, 2019).

Beyond these five banking institutions, the fintech ecosystem is still largely considered an emerging service in South Africa, with mobile money and payments at the forefront (Genesis Analytics, 2019). However, South African consumers have yet to unlock the plethora of non-traditional, business to consumer (B2C) and consumer to consumer (C2C) fintech products and services such as insurtech (insurance technology), lending (micro-credit), savings, investments and many more (Rand Merchant Bank, 2019). Therefore, the fintech space can be used as a key industry barometer of the level of digital transformation in consumer behaviours, and as a measure of South African consumers as both digital and fintech customers. This study emerged from this context, and explores the intersection between the consumer and business by researching customer adoption behaviours. The focus is largely on how consumers adopt new ways of moving, paying and saving money via non-traditional means such as fintech platforms. And how, as their usage becomes more frequent, fintech usage is being absorbed into their digital behaviour (Senyo & Osabutey, 2020).

It has been found, particularly in developing countries, that there are existing barriers to general consumer adoption of fintech into their digital behaviour. These barriers include a lack of knowledge, digital illiteracy and varying degrees of digital accessibility (Buckley & Webster, 2016). Whether these factors are applicable to the South African middle income market is what this study sought to investigate. This underlines the need for more thorough market research into the South African consumer behavioural landscape and its digital adaptive capacity, financial literacy, and consumers' current and future adoption of mobile fintech products and services.

The prospective fintech customer in South Africa is part of a large population of consumers who use financial services. This is an essential service for all economically active citizens – regardless of whether these customers are part of the formal or the informal economy. However, this study concentrated on the middle income customer segment as its key area of enquiry, primarily because it has greater purchasing power to be potential mobile fintech users. In addition,

their market value to fintech businesses could assist in identifying the drivers required for this market's uptake, since they are already traditionally banked.

Therefore, this markets motivation and drivers to switch from banking and adopt mobile fintech were one of the many entry points used by this study to investigate its current and future feasible adoption. Furthermore, the theoretical framework of Kane et al. (2019) for digital transformation and the widely used technology user adoption theory UTAUT-TAM (Khalilzadeh et al., 2017) informed this endeavour. Using these frameworks, this study conducted an in-depth investigation into customer adoption of mobile fintech for middle income market customers.

1.3 Research problem

Developed global market segments that are digitally active and already using fintech services currently pitch their products at an assumed level of proficiency in digital and financial literacy (Buckley & Webster, 2016). This does not cater for all market segments. Such a one-size fits all approach does not encourage onboarding and high behavioural usage of fintech by discrete financial segments such as middle income customers. Similarly, in the South African context, it has been found that fintech has been adopted predominantly by millennial customers, and uptake has been very low in other market segments (Lourie, 2020). This study recognised this problem as an opportunity to research mobile fintech adoption in other customer segments such as middle income consumers, specifically in the South African context.

The slow uptake of other customer segments in South Africa could be attributed to the lack of cultural interoperability. Fintech is a global product, which has gained significant traction in the developed world, and its transference to new markets in developing countries does not ensure cultural interoperability (Buckley & Webster, 2016). Studies show that failures of inter-market interoperability could be attributed to digital trust assurances, different cultural behavioural nuances, and levels of financial literacy. These inter-market differences should be

considered if mobile fintechs new market penetration is to successfully tap into the potential market share of South Africa's middle income market.

The market share of middle income customers, in terms of retail banking, is projected by McKinsey to contribute 70% of Africa's revenue growth (McKinsey & Company, 2018, as cited in Chironga et al., 2018). This high percentage exemplifies the middle income market's purchasing power in Africa, albeit from a retail banking perspective. It provides a lucrative market share that mobile fintechs could also target.

In addition to the above problem and market opportunity, the adoption drivers and barriers for the middle income market are academically underexplored. This study's search for fintech research found that studies targeted either the underbanked (lower-end market) such as the case of Wentzel et al. (2013), or millennial financial customers (higher-end market) where customers were already accustomed to technology (Lourie, 2020). The former unbanked or underbanked market is particularly well covered in emerging economy contexts, where fintech research is primarily concerned with consumers at the "bottom of the pyramid" (Prahalad & Hart, 2002) and their prospects of financial inclusion.

This identified research gap was the rationale for this study's investigation of the middle income market as opposed to other income markets. The investigation included an exploration of the middle income markets' financial and digital activities, and an examination of the predictor variables (both negative and positive) in their adoption of mobile fintech. Therefore, as this study aimed to exemplify, the middle income segment is an underserved customer market and requires a dedicated academic study to unpack its adoption of mobile fintech.

1.4 Research Objectives

The two research objectives developed were:

I. ***Research Objective 1:***

Examine the customer adoption barriers and facilitators of mobile fintech in the middle income market.

II. ***Research Objective 2:***

Explore the relationship between digitally transformed customer behaviour and the customer adoption of mobile fintech in the middle income market.

1.5 Significance of the study

This study addresses the problem defined above. The research focused on consumers in the hitherto under-researched middle income market. These consumers have reasonable digital and financial access, yet demonstrated low customer adoption of digital products such as mobile fintech (Lourie, 2020). It was hoped that by researching customer adoption in the middle income market would provide insights about these consumers for mobile fintech businesses.

In addition, the significance of this study lies in the overarching purpose of applying digital transformation theory to customer adoption, which is as much a human process of change as it is a technological one (Kane et al., 2019). Insight into digital consumer behaviour could provide an explanatory dimension to customer adoption for mobile fintech businesses in emerging economy contexts.

A similar study was conducted by Buckley and Webster (2016) who investigated the product design and adoption failures that global fintech players experienced when moving to new markets in emerging economies. They found that these failures in Azerbaijan and Niger specifically stemmed from a failure to capture local customer adoption nuances, and a lack of interoperability. This study aims to mitigate such oversights through a customer insights-driven enquiry, whose

significance lies in its facilitation of increased adoption of mobile fintech products and services for this market.

1.6 Delimitations of the study

1.6.1 *Financial Technology (Fintech)*

The delimitations of the fintech industry segmentations in this study included coverage from a customer-oriented perspective and not from a business to business (B2B) or non-mobile application aspect. Therefore, non-incumbent bank fintechs were the focus, specifically those that were predominantly at the Small Medium Enterprise (SME) level offering fintech products and services for the South African customer market.

More specifically, this study discusses mobile fintech technologies, primarily considering personal digital banking, B2C, and C2C (peer-to-peer) network-type financial activities. These three financial areas include payments, lending, savings and deposits, insurtech, investments (includes cryptocurrencies and crypto-trading) and financial planning and advisory segments.

This study excluded the following fintech segments: all non-mobile application fintech segments, B2B tech providers such as aggregators, RegTech (regulatory technology) and risk management. This exclusion list includes business focused products and services such as mobile point of sale payment segments, small business finance management and business banking.

1.7 Definition of terms

Consumer behaviour: defined as “activities people undertake when obtaining, consuming and disposing of products and services” (Blackwell et al., 2006, p. 4).

Digital Immigrants: an older generation of internet users who have adopted digital technologies at a later stage in life (Hoffmann et al., 2014).

Digital Natives: a subgroup of the millennial generation born into the world of digital. They are generally understood to be born between 1980 and1994 in South Africa (Thinyane, 2010) because of the historical context. Please note that, in contrast, global studies define digital natives as those born between the mid-1990s and the mid-2000s (K. T. Smith, 2019). Regardless of this contested definition, digital natives are a population group that is understood in terms of their technologically driven behaviour rather than their age only.

Financial Technology (Fintech): defined “a movement toward the digitization, decentralization, and disintermediation of economic transactions” (Catalini, Halaburda, King, and Vergne, 2017, as cited in Zalan & Toufally, 2017, p. 417). Fintech is also more specifically defined as “a segment that is at the intersection of the financial services and technology sectors where technology-focused start-ups and new market entrants innovate the products and services currently provided by the traditional financial services industry” (PwC, 2016, as cited in Zalan & Toufaily, 2017, p. 417).

Mobile fintech products and services (list is not exhaustive and covers B2C and C2C segments): digital banking, payments, savings, investments, lending, micro-credit, insurance technology (insurtech), peer to peer remittances, crowdfunding, cryptocurrencies and crypto-trading. These products and services are typically empowered by machine learning, big data, analytics, blockchain technology and open API’s (Application Programming Interface).

1.8 Chapter Outline of Report

Chapter 1 is the introduction to the research report and discusses the context, identified problem and relevance of the study.

Chapter 2 reviews literature that address the research objectives. Firstly, the comparative review of other emerging market cases is discussed. Secondly, the relationship between mobile and fintech is discussed in relation to the following topics:

- The relation between mobile phone usage and customer adoption of mobile fintech.
- Market comparison of mobile phones usage between the middle income market, and other customer markets.

Thirdly, the digital transformation aspects to customer adoption are discussed according to the following topics:

- Digitally transformed customer behaviour in terms of digital segmentation profiles, online behaviours, internet banking behaviours as an indicator of digital customer readiness.
- Digital readiness of local fintech industry and the economic conditions at large.
- Middle income market characteristics, in terms of its South African qualifiers and prevalent digital financial literacy.

Chapter 3 covers the research methodology used in this study. It describes the choice of design, multi-part research instrument, sampling criteria, data collection, data analysis approach, validity and reliability and the limitations observed.

Chapter 4 presents the results obtained from the analysis of the data collected using the multi-part instrument. Firstly, the primary and secondary samples are described. Secondly, the findings from the four parts of the instrument are presented as follows:

- Part 1: quantitative questionnaire results

- Part 2: qualitative barrier findings from the questionnaire
- Part 3: qualitative open-ended findings from the questionnaire
- Part 4: qualitative findings from semi-structured interviews

Chapter 5 presents the discussion of the findings, which provide answers to the four research questions designed to meet the objectives of this study.

Chapter 6 concludes the research study. It provides recommendations for business, research and government stakeholders, and also describes the limitations of this study.

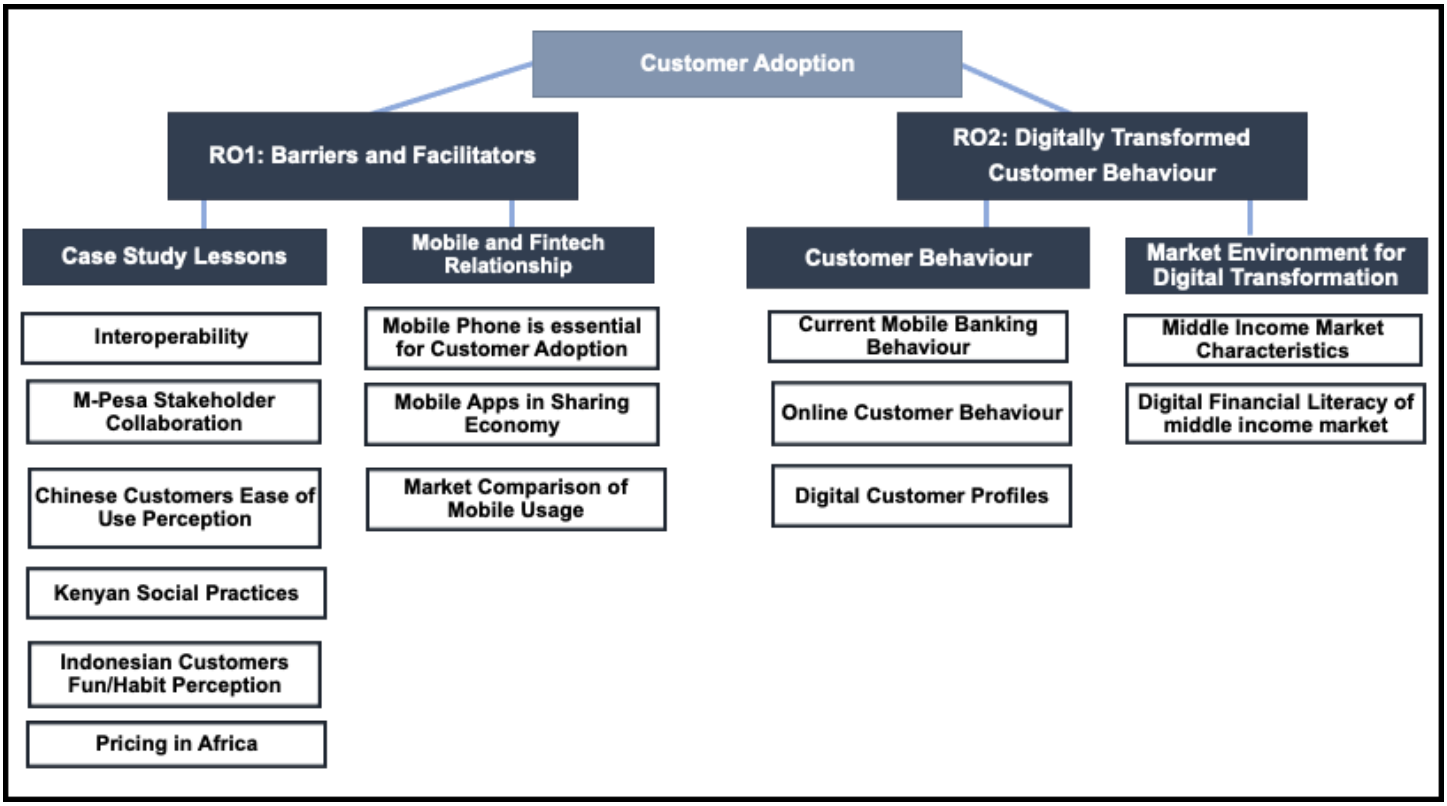
CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

The purpose of this literature review was to conduct a critical investigation of the literature available on customer adoption in the South African middle income market context. This investigation was guided by the conceptual frameworks shown below, and done by discussing this study's research objectives which sought to firstly unpack the barriers and facilitators to customer adoption, and secondly is the proposed relationship between digitally transformed customer behaviour and the customer adoption of mobile fintech.

The literature review map (Figure 2.1) represents the flow and addressed topics under each research objective.

Figure 2.1: Literature Review Map



2.2 Background discussion

Global consumers in developed countries see the digital world and the technologies that come with it as a place to 'live out' an extension of their lives. Russel W. Belk terms this the "extended self in the digital world" (2013, p. 478) where all things digital have created a phenomenon where consumer identities converge in the immaterial digital world and physical reality. This convergence has redefined how digital consumers perceive themselves through online narratives, and interactions with others through social networks. The resulting digital behaviours are best exemplified in how consumers consume, present and perceive themselves online in terms of posting avatars (representation of self), purchasing digital commodities (possessions) and storing digital information (memories) (Belk, 2013). Belk's concept provides an evolutionary view of the current and possible digital future for South African consumer behaviour as they adopt new digital technologies in their lives and thus reach this point of merging the physical and digital realities into one reality. This type of new consumer behaviour was important to the overarching aim of this study which was to zone into the adoption phase of digital transformation (DT) (Kane et al., 2019) and expand customer insights on the behaviour of middle income customers – particularly as it pertains to their financial behaviour.

The rising assimilation of digital technologies into the everyday lives of consumers will not only affect consumer behaviour, but also digital businesses. This literature review sought to understand the context of digital businesses such as mobile fintechs as they adapt and modify their products and services to cater for a digital consumer whose behaviours are increasingly enabled by digital tools and technologies. Therefore, as consumer purchasing decisions take place online more frequently, and businesses continue to embrace 'digital' as an extension integral to their business model – it was hoped that researching the area of customer adoption would provide rich research findings for both businesses and customers.

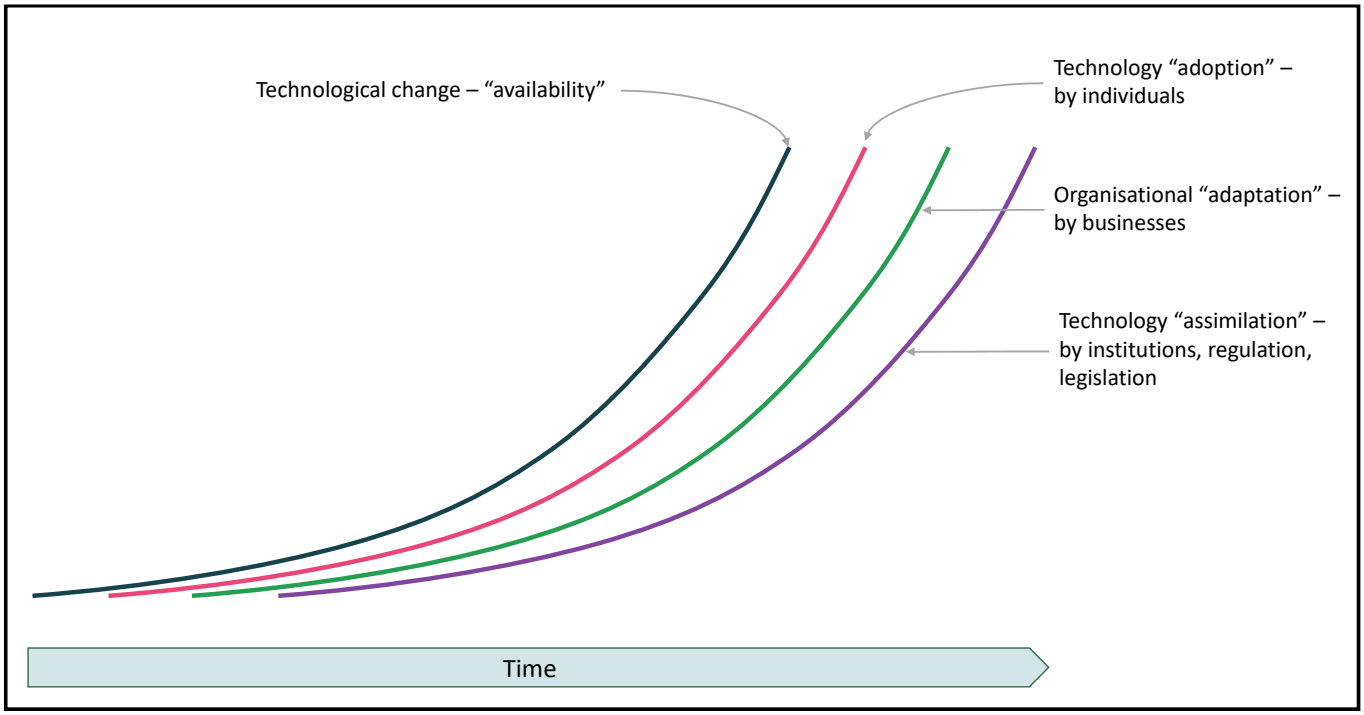
2.3 Conceptual Frameworks

2.3.1 *Theoretical Framework*

This study employed a Digital Transformation (DT) theoretical model as per Kane et al. (2019) conceptualization. The graphic below (Figure 2.2) represents this study's conceptual cornerstone, where the four phases in DT are visually shown by Armstrong (2020) as follows:

I. Firstly, the technology becomes available.
II. Secondly, customers adopt the technology.
III. Thirdly, business adapt to customer adoption.
IV. Lastly, institutions assimilate technology into their structures.

Figure 2.2: Armstrong (2020, slide 8). sourced from Kane et al. (2019) DT concept



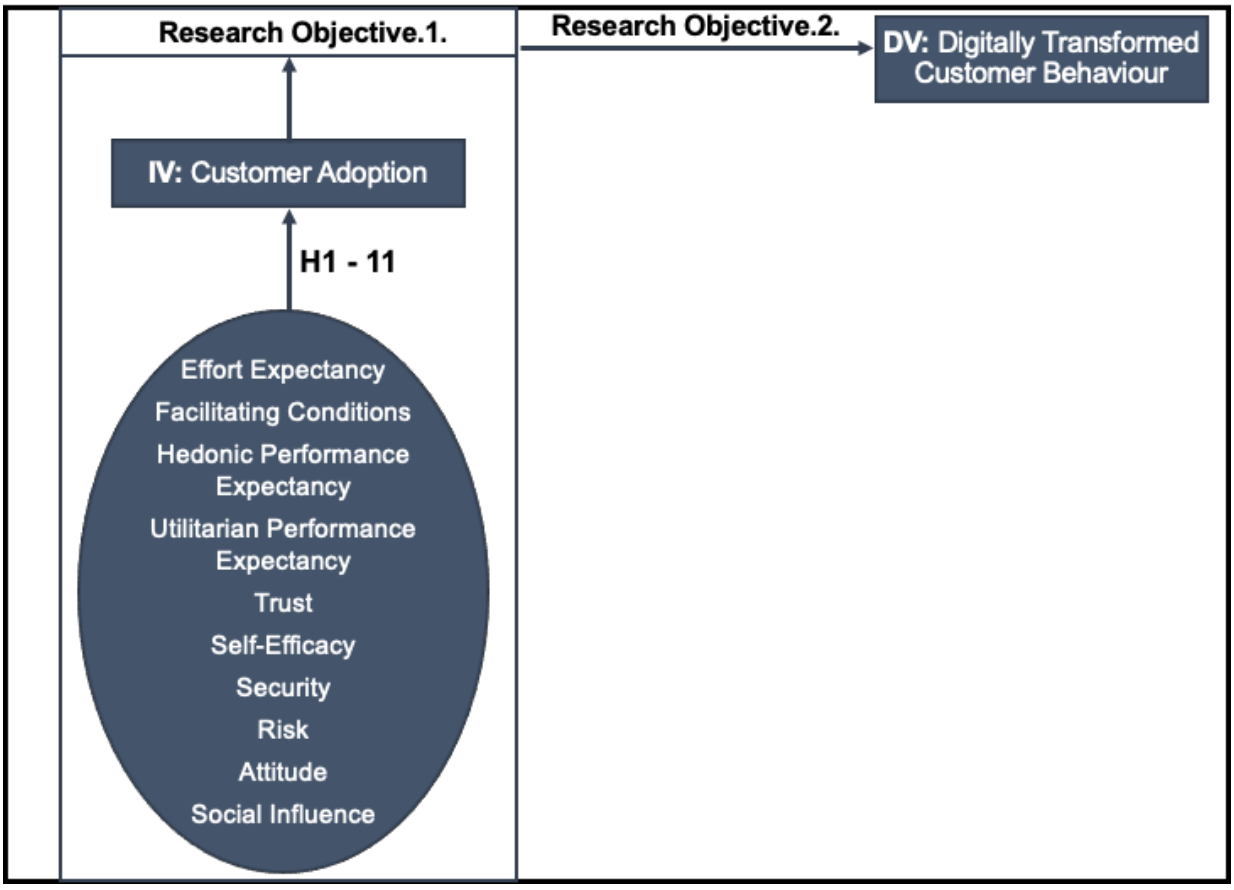
These four phases depict the availability of the technology first, and customer adoption as the second driver that propels DT into businesses and institutions. Kane et al.'s (2019) inclusion of the customer is a unique addition to traditional organisational DT theory as it focuses DT on customers adopting the available technology.

Furthermore, the success of DT as argued by Kane et al. (2019) is determined by how quickly businesses and institutions adapt and assimilate to customer adoption – and not the reverse as one may assume. In the case of mobile fintech businesses, it therefore becomes essential that their products and services are positioned to rapidly respond to anticipated customer adoption. Hence this study utilized this theory as a guide into the customer adoption phase of DT, in the context of the middle income market.

2.3.2 *Organising Framework*

The organising framework (Figure 2.3) depicts this study's key concepts of customer adoption and digital transformation.

Figure 2.3: Organising Framework



The framework demonstrates the proposed positive relationship between customer adoption of mobile fintech (RO1) and digitally transformed customer behaviour (RO2). This framework thus organizes the mixed methodology employed, by integrating the main quantitative hypotheses (H1 – H11), which were derived from the Unified Theory of Acceptance and Use of Technology-Technology Acceptance Model (UTAUT-TAM), and how these hypotheses outcomes positively impact digitally transformed behaviour within middle income market customers.

2.4 First research objective

RO1: Examine the customer adoption barriers and facilitators to customer adoption of mobile fintech in the middle income market.

In this section customer adoption barriers in other emerging economies are discussed. Reviewing these barriers and in some cases the facilitators of mobile fintech adoption, created a point of departure for research objective one by demonstrating the lessons learnt and how digitally transformed customer behaviours were in those contexts. South African specific barriers and facilitators are also discussed, in terms of the relationship between mobile and fintech and how these two factors are related.

2.4.1 *Comparative case study lessons*

Fintech firms have already disrupted the traditional financial services industry and passed incumbent banking strongholds in developed countries (Mungai & Bayat, 2018). Fintech firms, in emerging economies like South Africa's, have progressively increased to 217 businesses in operation over the past 11 to 12 years at the time of this study (Genesis Analytics, 2019). However, their market penetration is relatively small, and their valuation is currently only an estimation (Genesis Analytics, 2019) in comparison to the technologically sophisticated banking sector, which leads the financial services sector in South Africa (Genesis Analytics, 2019). Therefore, discussing case study lessons from other emerging

countries was a key area when reviewing the drivers and barriers facing the customer adoption of mobile fintech through various contextual lenses.

A well-known fintech success case study is Kenya, where mobile money in the form of M-pesa entered the market in 2007 through a telecommunication collaboration between companies Safaricom and Vodacom (Burns, 2018). The name M-pesa is derived from “m” for mobile and “pesa” for money in Swahili. With a 70% rate of customer adoption for more than 10 years, M-pesa as a digital payment system is proof of a successful capitalisation on the convergence of consumers need for an essential finance services meeting their high mobile phone usage (Natile, 2020). There are also other reasons for the high customer adoption rate of M-pesa by the Kenyan population, which could not be replicated in other developing African countries such as South Africa when M-pesa was attempted in 2010 (Dagada & Townsend, 2012).

Dagada and Townsend (2012) believe one of the reasons for the high customer adoption of M-pesa in Kenya was Safaricom’s monopoly in the country’s mobile market. South Africa, in comparison, did not have one telecom in monopoly at the time. So for a high mobile money customer adoption to be possible in 2010, several telecoms players with common standards needed to have been “interoperable” (Dagada & Townsend, 2012) – but this was not the case. Furthermore, the South African mobile money market was already a highly competitive space, with retailers such as Shoprite, Checkers and Spar offering the then primary target market of mobile money, the unbanked, transacting options that did not require bank accounts (similar to what M-pesa was offering). Dagada and Townsend (2012) argue that in more complex economies, like in South Africa, it is thus important for multiple stakeholders such as telecom operators, banks, mobile manufacturers, and retailers to work together if mobile money is to thrive.

A second perspective from Morawczynski (2011) on the lessons from Kenya’s high customer adoption suggests that M-pesa simply embedded itself within already established societal practices such as sending money to family. She believes that M-pesa’s high customer adoption was also the result of the systematic orchestration by social, economic, legal and political actors of M-

pesa's technology in Kenya. Therefore, the high customer adoption rate could not be credited solely to the introduction of the M-Pesa product to the Kenyan market (Morawczynski, 2011).

Thirdly, Burns (2018) credits Kenya's enabling regularity environment for M-pesa's market success. In terms of the drivers of high customer adoption, Burns (2018) attributes possible socio-economic factors such as Kenya's densely populated urban areas, and the strong domestic remittance market.

Since M-pesa served mainly low-income citizens in Kenya (Burns, 2018), the transferability of these fintech adoption lessons is valuable yet limited for South Africa's economically complex context. Several academics have attributed the early success of mobile money in Kenya to be a uniquely Kenyan experience, as there is a lack of general consensus on the reasons behind it (Burns, 2018). So for the South African context; a cross-industry interplay is required, to firstly enable fintech industry penetration and secondly customer adoption, as explained by Dagada and Townsend (2012).

A second case study concerns the emerging economy of Indonesia where, in comparison to Kenya, there is a low customer adoption of mobile money or mobile commerce (Megadewandanu, 2016). Although the convenience and ease of use of fintech was recognised by customers, electronic payments or m-commerce payment transactions only amounted to 1% of the Indonesian market in 2016 (Megadewandanu, 2016). Using a small sample of studies that used the UTAUT2 model, academics Megadewandanu (2016) predicted that the main facilitator of fintech services such as mobile money in the future Indonesian market would be habit and fun, more than other customer adoption drivers.

The last case study reviewed was that of leading fintech market of China, which is an invaluable example on the possible future of mobile fintech in the developing world. China has rapidly developed the required digital technology at a societal level, and inculcated a digital culture at an individual customer level. These developments has thus seen an astronomical customer adoption rate of 95% during the past decade (EYGM Limited, 2019). The EY Global FinTech Adoption Index 2019 explains that this customer adoption rate is largely within the money

transfer and payment application categories, where mobile fintech services such as P2P payments, mobile money payments, and in-store mobile payments are markedly high (EYGM Limited, 2019). There are three reasons for this high customer adoption rate. The first is an absence of a historical banking infrastructure developed over decades, unlike in the developed world (Arner et al., 2015). This means that there was not a banking stronghold to disintermediate once fintechs entered the market. Furthermore, China's internet technological explosion coincided with its fintech revolution, which is best exemplified in the large internet user base of 721 million consumers in 2012. Added to this, China's digital banking customer numbers are projected to reach 900 million in 2020 (Arner et al., 2015), which almost represents the entire Chinese population. The third reason behind China's high customer adoption rate is customers' perceived ease of use of fintech, specifically the ease with which a fintech account can be created (EYGM Limited, 2019). In summary, it is due to a combination of the internet opportunity, the products value proposition of ease as well as the lack of a banking infrastructure that accelerated the adoption of mobile fintech in the Chinese customer market.

In their recent study of the "internationalization of African fintech firms: marketing strategies for successful intra-Africa expansion", Bick et al. (2020) offer an interesting dimension to the debate of fintech customer adoption in emerging economies, albeit from a marketing perspective. Through on-the-ground interviews with fintech businesses, they uncovered reasons that were outside the usual technological user adoption models and socio-economic drivers for the customer adoption of fintech. Bick et al. (2020) mention factors such as brand association, brand familiarity and affordability as key customer adoption facilitators. They explain that intra-cultural marketing nuances such as using ethnicity, language and culture can facilitate better customer adoption uptake by associating a fintech brand with what customers already know. In addition, customers with different spending habits will be motivated to use fintech if these are offered at competitive prices. Therefore, affordable pricing is another key adoption facilitator for many emerging economies where fintech is a new phenomenon, according to Bick et al. (2020). They conclude that a "bottom-up" approach and value proposition is integral to successful customer adoption and

the cross-market transferability of fintech across different emerging economies (Bick et al., 2020).

The literature reviewed above provided various reasons for customer adoption of mobile fintech in various emerging economies. Reasons range from cross-industry orchestration, regulatory environment, customer habits, pricing and perceived ease of use. Firstly, all these reasons may be barriers or facilitators for customer adoption depending on whether a factor is a hinderance or positive influencer to adoption. Secondly, each case study exemplified the need to at all times start with the customer – a fundamental concept of design thinking. Authors in the field of agile and digital transformation principles, Dam and Siang (2020) regard design thinking as a move away from a product design focus only, and into customer-centric design thinking. Therefore, research such as the present study should reveal not only product failures or appealing product features but go further to understand the customer whom the product will serve. Moreover, as greater customer adoption of mobile fintech occurs in more mobile fintech industry segments besides payments, more in-depth research is required to unpack the adoption facilitators and barriers from the customers perspective and experience. This approach emphasises the need for developing markets to be treated as unique, with their own cultural and digital behavioural nuances, in order to ultimately provide richer customer insights and stimulate real customer adoption.

2.4.2 *Relationship between "mobile" and "fintech"*

The convergence of mobile communications and financial services is a key factor in the growth and success of fintech in emerging economies, particularly in Africa. And in order to meet the simultaneously rising customer demand, there is a need to offer financial services primarily on mobile platforms to facilitate immediate and constant access for customers. Fintechs can fulfil this need through their completely digital offerings without the burden of traditional brick-and-mortar establishments. Fintechs are thus primarily digital platform businesses directing customers to their online marketplaces (Genesis Analytics, 2019). Owing to the exponential traffic of global mobile data (Ericsson, 2019), customers are likely to

engage fintech platforms through an application platform on their mobile phones. Arner et al. (2015) confirm that in developing countries, with China leading the pack, the Fintech 3.0 and FinTech 3.5 movement (which started in 2008 during the Global Financial Crisis) brings with it an urgent need to transform legacy networks (in some countries) and prioritise mobile services. Therefore, it is important to review the "mobile" aspect of fintech particularly because this study was a customer-oriented or demand-side enquiry; that aimed to understand how mobile fintech services and products could better reach customers (B2C) whilst they provide application platforms upon which customers can connect to each other (C2C).

A mobile application is defined as customisable software that consumers download and install on their mobile or tablet device (Balabanoff, 2014). There are various types of mobile applications, ranging from social, gaming and instant messaging types (Balabanoff, 2014). However, for the purposes of this study, the focus was on mobile fintech applications used by South African customers, where the following segments occupy biggest market shares in the fintech ecosystem: payments (30%), lending (12%), investments (10%), insurtech (9%) and savings and deposits (6%) (Genesis Analytics, 2019). The adoption of fintech via mobile applications is thus an integral touchpoint for customers – particularly in the stated fintech industry segments.

The sharing economy comprising of platform businesses is a digital transformation phenomenon on a global scale and some mobile fintech applications, such as peer-to-peer (P2P) marketplaces and crowd investing platforms are included in this. Other elements of the sharing economy are social commerce and m-commerce platforms. The sharing economy is defined as "an economic system in which resources are exchanged among private individuals, free or at a cost, primarily through web methods" (Maziriri et al., 2020, p. 77). Some fintech segments do feature and facilitate such exchanges on their applications, and they are mainly based on P2P or C2C networks such as lending or financing and crowdfunding platforms (Genesis Analytics, 2019). However, local mobile fintech platforms have not penetrated the mass market to the same degree as AirBnb and Uber examples, which are leading businesses in the global

sharing economy as a result of the “network effects” created through P2P exchanges (Parker & Van Alstyne, 2005). Despite the lack of local industry penetration, access to financing instruments on such platforms provides prospective mobile fintech customers with convenient ways of acquiring funds and accessing credit through their mobile smart phones. These developments demonstrate how accessing fintech services and products via a mobile smart phone is a key facilitator not only to drive mobile fintech adoption but also to engage the broader sharing economy, which could trigger network effects for the South African middle income market.

I. Relationship between mobile phone usage and adoption of mobile fintech

A PWC report on South African online shopping behaviour observes that many consumers would like an omni-channel shopping experience that includes multiple touchpoints that are both digital and physical, such as in-store experiences (PwC South Africa, 2016). Since mobile fintechs rely on digital financial experiences with no physical in-branch option, this creates a competitive advantage for incumbent banks to provide an omni-channel financial experience to customers. However, customer behaviour is changing as there is an equal 40% split between African customers who prefer to visit bank branches, and 40% who prefer to transact digitally (Chironga et al., 2018). An example from a developed country is Germany’s Deutsche Bundesbank’s decision to reduce its physical branch network from 50 000 in 1990, to 34 049 branches by 2015 (Puschmann, 2017). The reduction of physical components to financial services is the result of rapid digitisation and a drive towards self-service technologies (SST) that has made global and local banks alike embrace an omni-channel approach for customer engagement (Puschmann, 2017). Therefore, changing customer preferences and incumbent banks increasing use of digital channels presents an opportunity for mobile fintechs to compete and provide substitute options for customers.

The rise of fintech essentially means the physical components in financial services are being removed, and becoming completely digital (Puschmann, 2017), depending more on digital channels such as mobile applications. These

become the main touchpoint to educate, sell and engage with customers (Arner et al., 2015). From a South African country-level perspective, there is greater consumer internet penetration through mobile phones than any other device – almost 60% of South Africans (29,2 million) use the internet via their mobile phones (Kemp, 2018). Furthermore, the number of smart mobile phone owners has increased in the country as phone prices have decreased by 41% from 2012 to 2017 (Genesis Analytics, 2019). Therefore, with the increased consumer ownership of smart mobile phones and high internet use on mobile phones creates a strong platform upon which mobile fintech applications can spur customer adoption on.

As is to be expected, there are some are contrary views. Chigada and Hirschfelder (2017) argue that South African consumer ownership of smart mobile phones might be high, but the rate of information communication technology (ICT) adoption is low. With the low ICT adoption rate, particularly with regard to mobile banking applications, of 15%, Chigada and Hirschfelder (2017) hypothesise that the fact that customers are required to have bank account acts as a barrier to mobile banking application uptake. Their hypothesis means that despite high mobile phone usage and ownership, it doesn't equate to mobile application or ICT adoption due to the already observed low mobile banking adoption in South Africa. This study noted that Chigada and Hirschfelder (2017) argue primarily from a sociological perspective, which is sometimes in the interests of financial inclusion. This study, on the other hand, investigates adoption behaviour from a more behavioural economics perspective for a financially included market. Furthermore, the middle income market comprises of individuals who are banked, and their rate of ICT or mobile fintech application adoption is yet to yield academic research, further justifying a study like this looking into their adoption drivers and barriers.

II. Market Comparison of Mobile Phone Usage

James (2013) offers an alternative evaluation of the complexity of the relationship between mobile phone ownership and usage behaviour. He proposes that the poor (lower-end market) use mobile phones more than the rich (middle income or highly affluent class) because the latter market have access to infrastructure

such as formal healthcare, transport and banking. He argues that the poor, therefore, have a greater dependence on mobile phones for services such as mobile money and mobile health applications. James (2013) further argues that mobile phone (USSD-driven) and digital mobile applications are therefore an equalizer between lower and middle or upper markets which lessens the effect of the digital divide. This study supports this view insofar as the lower-end market's dependence is on low-end smart mobile phones (Genesis Analytics, 2019) and feature phones - not necessarily on the smart mobile phones used by middle and upper middle income markets where mobile application use is prevalent. Thus, as more middle income market research is conducted, the result of an equally high dependence on mobile phones by middle and higher income customer markets could be found.

Moreover, 55% of the South African consumer market uses a smart mobile phone that can download applications, according to Capitec CEO Gerrie Fourie (C. Smith, 2019). Although Capitec's target market is primarily those in the lower-end customer market who were previously unbanked, many of their mobile banking functions are USSD-driven and allow for usage on feature phones that are not smart phones (Smith & Taqi, 2020). In contrast, the middle income market forms part of 55% of South African consumers with application downloadable smart mobile phones that are higher-end, representing more than half the consumer landscape of prospective mobile fintech customers. This study thus intended to understand the middle income market's financial behaviour on their mobile phones, as it is a more digitally transformed market in terms of their seemingly high level of internet access and higher level of smart mobile phone ownership. Nonetheless, the usage behaviour of this market, particularly on mobile platforms, needs further exploration.

The digital behaviour of the South African middle income market in terms of mobile fintech adoption and mobile banking usage is discussed further in the following section (section 2.5); however, it is important to note the complexity of this matter, where smart phone ownership is seemingly high without matching ICT or mobile application use (Chigada & Hirschfelder, 2017). In addition, bank account ownership is high; 80% of South Africans own a bank account (Deloitte,

2019) but their mobile banking usage does not match this figure. This latter point is an important factor in examining the customer market environment which mobile fintechs have entered and the digital transformation considerations required. One of these considerations is the middle income market's current usage of mobile banking or online banking as a potential barrier to increasing mobile fintech adoption.

2.5 Second research objective

RO2: Explore the relationship between digitally transformed customer behaviour and customer adoption of mobile fintech in middle income market.

In this section the various factors related to digital transformation (DT) are explored. Factors such as the digital readiness of mobile fintech industry and financial services at large, current internet banking behaviour, digital customer segmentation and general online customer behaviours are discussed as possible impactors on customer adoption.

2.5.1 *Digitally transforming customer behaviour*

Local research on digital consumer behaviour has shown that the rise of digital technology and the demonetisation of some of these technologies, particularly with mobile technology, has resulted in a shift in the rules of business (Kane et al., 2019). This shift is most evident in the change in power dynamics between consumers who were traditionally receivers of information in the pre-fourth industrial revolution era (pre-1980s). It is through digital enablement that consumers are now also senders of information (Botha et al., 2020). This also means that commercial value creation in the digital era is relational in nature and may be either a two-sided or a multi-sided interaction, depending on the type of platform (Parker & Van Alstyne, 2005).

Consequentially, consumer behaviour itself is transforming and requires a DT conceptual lens to examine how a digital user (via casual browsing) can transform into a digital customer (an adopted user with online transacting behaviour). This

is a transition that is yet to be explored among middle income market customers, as it has the potential to affect the speed or slowness of the DT phases. The faster mobile fintech businesses adapt to the kind of customer who has adopted mobile fintech, then the faster the DT process (Kane et al., 2019).

It is important to understand the digital aspect of consumer behaviour, and this review section highlights this topic as it relates to current online behaviour of prospective mobile fintech customers. At present, online consumer behavioural studies are comparatively less developed than general consumer behavioural studies (Hanekom & Barker, 2016). For this reason, Hanekom and Barker (2016) identified the need for a theoretical framework to synthesise the currently fragmented approaches. They also recognised the need for a criterion that would specifically address the theoretical shortcomings of online consumer behaviour theory in terms of when consumers seek information online, and what customers' consumption patterns actually are via the web (Hanekom & Barker, 2016).

Other scholars who have also found shortcomings in online consumer behavioural studies are Sigurdsson et al. (2015), who conducted key explorative research in this area. They developed an online behavioural perspective by comparing consumer decisions in traditional bricks-and-mortar contexts versus digital contexts. Their paper "Behaviour analysis of online consumer behaviour" (2015) reviews studies on consumer behaviour by researchers who used mixed methods of data collection. These included observing the actions consumer subjects took during online field experiments on social platforms, and simulating online malls to understand the digital behavioural drivers and non-drivers for consumers in an online environment. Over a four-year timeline, from 2009 to 2013, the research outcomes from these observational experiments demonstrated what consumers actually did in the online environment, and not necessarily what they said about their online behaviour (Sigurdsson et al., 2015).

Data from such experimental research exposed digital barriers to customer engagement and customer adoption. The observed behaviours from these samples showed varying clicking behaviour and product engagement, depending on the nature of the product. For financial or banking related products such as digital banking, the need for privacy assurance pop-ups became paramount. A

privacy assurance such as seeing a digital security certificate immediately or reading through the terms and conditions influenced many customers to gain trust in digital services, and assisted customers with their decision-making on whether or not to utilise the digital service. An example of this was a particular customer segment of older mothers who demonstrated greater interaction with an e-banking platform when the additional security measures mentioned above were available (Sigurdsson et al., 2015). Other researchers in the same study found that digital barriers to non-financial online platforms included themes of web design issues, trust/privacy concerns, retail prices or social media marketing issues (Sigurdsson et al., 2015). These observations and findings indicate that the potential customer adoption of mobile fintech requires a deep understanding of customer behaviour in the digital platform environment.

I. *Current Internet Banking Adoption*

The majority of fintech companies that provide products and services are platform businesses without the traditional brick-and-mortar establishments like the incumbent banks (Genesis Analytics, 2019). Banks and fintechs differ in their offerings, although they both use digital platforms. Thus, in the mind of the South African customer market, mobile fintechs could be placed in the same category as mobile internet banking services. For this reason, a discussion of the literature dealing with internet banking behaviour in South Africa was necessary to explore this study's second objective of the relationship between digitally transformed behaviour and customer adoption of mobile fintech. Aguidissou et al. (2017) conducted a key consumer behavioural study in this area, focusing on the South African student population to assess their lack of adoption of internet banking, despite its introduction by incumbent banks in 1996, and mobile banking introduced in 2000.

Amongst their findings related to a need for innovation and the lack of consumer readiness for Self-Service Technologies (SST). Aguidissou et al. (2017) also found that SSTs such as ATMs and debit cards were widely adopted and used; however, consumer scepticism about internet banking specifically remained. The limited use of internet banking suggested customer concerns related to data privacy, security and exposure risk to third parties. In addition, it was found that

the internet banking user rate in the country was as low as 23% in 2017 (World Wide Worx, 2013, as cited in Aguidissou et al., 2017, p. 7). Furthermore, customer engagement with internet banking was primarily at the functional level of only checking account balances, account transfers and third-party payments (Aguidissou et al., 2017). Aguidissou et al. (2017) concluded their study by encouraging further research into the reasons behind a lack of South African customer adoption of SSTs such as internet banking. This study endeavours to address this gap, for middle income market customers specifically, to not only better understand current internet banking behaviour since 2017 but also to update the research in the context of mobile fintech applications.

II. *Digital customer segmentation*

Multiple customer segmentation models have been developed for purposeful marketing in the current highly digital era. For example, the use of digital personas to segment and understand the online marketplace is common. This study identified the following segments of digital natives, digital immigrants, digital laggards and digital aliens, as described by Kaufman (2011), as useful digital profiles for customers with digitally transforming customer behaviour in the South African middle income market.

Firstly, digital immigrants have mainly non-digital, traditional memory and commercial product associations that pre-date their use of internet and digital technology (Hoffmann et al., 2014). They do not have the same level of historical digital exposure as digital natives; however, they have become digitally literate over time. Therefore, their level of customer engagement and perceptions have been informed by brand experiences that are traditional ATL (above-the-line) such as television and offline marketing such as in-store promotions, print, personal selling and so on. Such considerations are key to tailoring digital customer experiences for digital immigrants who are potentially seeking existing products and services that are also traditionally offline, such as banking, and who have difficulty adopting new products and services, such as mobile fintech. Secondly, digital natives, considered a “subset of millennials” are a population group segmented according to their past and present behaviour that is highly digitally literate. Their behaviour is best exhibited through their high internet

usage, above-average knowledge of digital and close access to digital technologies rather than by their age per se (K. T. Smith, 2019).

The remaining two, smaller digital customer segments, as defined by Kaufman (2011), are firstly, digital aliens. These are consumers whose lives are lived primarily offline and who rarely interact with digital technologies. Second are the digital laggards who have limited digital exposure and are usually the last adopters of digital technologies.

It was noted in the present study that, in South Africa, the digital native segment has been disproportionately targeted by fintech businesses (outside the incumbent banks) (Lourie, 2020) because of their high levels of digital adoption, digital literacy and their position on the right side of the digital divide. This is understandable as there is simply more data available on this digital customer segment, as they had already adopted digital behaviours prior to mobile fintech exposure. This study aimed to further enrich the customer behavioural landscape, in addition to digital natives, by including behavioural features in the form of digital profiles to assist the discussion of how digitally transformed customer behaviour looks for the middle income market.

2.5.2 *Digital Transformation in Local Fintech Industry*

I. *Industry Capacity to Adapt to Adoption*

The assumption that because a business is digitally mature in many aspects, or it only sells digitally-accessed products and services then it must be a digitally transformed business. This assumption is in question for the local mobile fintech industry, since its capacity to adapt to digitally transforming customers is determined by its own digital readiness. Therefore, there was a need to review literature which defines and illuminates the current DT journey in the fintech industry in South Africa. This section reviews literature that covers the fintech industry in terms of its current digital disruptiveness and industry market environment; there was scant information on how DT has filtered through to the mobile fintech industry's ecosystem, however.

Kane et al. (2019) explain digital disruption as a re-arrangement of the rules of business through digital technologies. This is in contrast to DT, which concerns how businesses adapt to changes caused by digital disruption (Kane et al., 2019). Successful and continuous DT comes as businesses' rate of adaptation happens at the same pace as consumer adoption, or just after consumer adoption of digital technologies. Therefore, the relationship as proposed by Kane et al. (2019) between individual customer adoption and organisational business adaptation is key to a conceptual grasp of the DT process and the DT prerequisites for mobile fintech businesses.

Moreover, it is imperative to transfer Kane et al.'s (2019) definition of DT to the fintech industry in an emerging economy context like South Africa's. This is not a simple task because DT is a highly contested concept, and there are divergent views globally in the various contexts in which DT is discussed (Böhm et al., 2018). Despite this lack of consensus, Böhm et al. (2018) recognise that most DT literature is derived from Organisation Transformation (OT) theories and regard DT as a revolutionary or an evolutionary form of innovation. Furthermore, they argue that DT is not always subjected to an industry level analysis. Despite this, they acknowledge that DT also gives rise to new ecosystems – which is a uniquely characteristic of fintech (Böhm et al., 2018, p. 24). Similarly, the definitions of DT provided by both Kane et al. (2019) and Böhm et al. (2018) characterise DT as a change programme that does not end with one disruptive encounter but is adaptive and ongoing due to the changing adoptive digital behaviour of its customers. This demands of mobile fintech players to go further than a digital disruption occasion, but ensure continued DT by preparing for increased customer adoption and retaining those customers.

Another aspect to DT as it relates to the fintech ecosystem is that this ecosystem does not exist in a bubble that cannot be digitally disrupted – it can. The nature of DT is one of rapid change with the changing rules of business (Kane et al., 2019), therefore industry lines are blurring. This is because industry competition does not operate in the same way as in the pre-digital era, due to the increase in fluid industry players (Rogers, 2016), even in the case of emerging economies. PwC (2019) reports that "many TMT [technology, media and telecommunications]

companies are applying for FS [financial services] licences, and FS organisations have begun calling themselves technology companies" (PwC, 2019, p. 3). A local example of this is the telecoms company MTN offering digital wallets called "MoMo" and partnering with over 30 000 e-commerce websites to allow customers to pay via their Momo wallet without entering credit card details (McLeod, 2020). Another example of a fluid company is First National Bank's (FNB) offering of "FNB Connect" sim cards as an extension to customer bank accounts, and the offering of loyalty rewards as incentives to their target middle income market (McCleod, 2015). Such fluidity in the new digital economy places the fintech ecosystem in a situation in which it must be always innovating, always changing, to keep in step with DT (Newman, 2017) and new fluid competitors. Newman's (2017) stance on DT confirms Kane et al.'s (2019) argument that consistent innovations in terms of business model, strategy, leadership and digital technology will ensure that fintechs meet the changing needs and demands of digital customers.

II. *Digital Readiness in Fintech Industry*

The need for the fintech industry to innovate and be digitally ready is directly linked to the enablement of economic and regulatory structures surrounding the industry. Many fintechs in the South African ecosystem are start-ups (Genesis Analytics, 2019); their success in emerging economies depends firstly on the availability of technology and talent to enable business model innovations. Secondly, their access to traditional capital markets for financing (Haddad & Hornuf, 2019) is also a key determinant of economic enablement. Haddad and Hornuf (2019) conducted an important study on the economic drivers of fintech business formations and found that only developed economies with traditional and venture capital markets could enable fintechs to thrive economically. However, there is a South African example of fintechs accessing capital through Rand Merchant Bank's incubator arm, AlphaCode (Ventureburn, 2019). In this instance, AlphaCode invested R16 million in eight local fintech start-ups (Ventureburn, 2019) to accelerate and enhance their growth in the economy. Admittedly, one incubator cannot sustain an ecosystem of fintechs. Nonetheless, South African fintechs are becoming more entrepreneurial and innovative to

combat this. However, more local capital instruments like AlphaCode's or from global venture capitalists are required to establish the fintech sector and ensure economic and digital readiness.

The second requirement for innovation in the fintech industry and to increase its digital readiness is linked to regulatory enablement within South Africa. The local banking sector is highly regulated and its good regulatory standards are recognised as among the top ten in the world (Coetzee, 2019). The role of regulation in financial services is generally to ensure economic stability, encourage trust from customers (Coetzee, 2019) and reduce the risk of failure (Ashta, 2017). Since South Africa's fintech industry is still building its foundational blocks and innovating at a fast pace, regulatory parameters for such innovative activity have not yet been fully formalised. Accordingly, loopholes exist and render fintech a risky business for mass market use and one that will provide little recourse for customers in the event of transaction failure, fraud or loss (Genesis Analytics, 2019).

The regulatory framework for fintechs in this country remains reactive to innovative developments, rather than proactive (Genesis Analytics, 2019). This is despite the South African Reserve Bank's (SARB) instituting a working committee to monitor fintech activity in South Africa and establishing the SARB Vision 2025 to foster competition in the payment value chain (Genesis Analytics, 2019). Moreover, the additional fluid TMT players and the interconnected nature of fintech collaborations within the ecosystem further complicates the provision of regulatory control at an industry level. This regulatory complexity is not unique to South Africa, as other emerging economies are experiencing similar hinderances because of the lack or non-enablement of regulatory standards.

For example, Burns (2018) credits Kenya's enabling regularity environment for M-pesa's market success. Burns (2018) argues that the success of other mobile money issuers hinges on relaxed financial and legal regulations that do not require stringent compliance that hinders non-traditional business models, as is currently required for mobile money fintechs (Burns, 2018). These fintech entrants, he explains, are creating services in the interest of financial inclusion as they address social problems and achieve profit by serving citizens with low

incomes. Therefore, the relaxation of know your customer (KYC), anti-money laundering laws, due diligence rules for customers and other costly regulations are necessary to allow fintechs to thrive in a market environment (Burns, 2018). In contrast, Singapore, London and Hong Kong have introduced “sandboxes” to allow fintechs to experiment with novel products and services for customers before regulations are passed (Puschmann, 2017) and licensed. Kenya, Sierra Leone and Mauritius are the first African countries to use sandboxes and the SARB has announced plans to introduce one in South Africa as well (Genesis Analytics, 2019) but its launch is yet to be recorded.

A third dimension that affects the digital readiness of fintechs is the need for more cyber-security controls within the sector. As more TMT, internet companies and fintech start-ups that are not traditional banks handle customer finances and data information (PwC, 2019), it is increasingly important to regulate all ecosystem players to ensure that customers are protected against arbitrage or cyber-security crimes. As for customer protection, Arner et al. (2015) argue that the developing world is not concerned about the potential dangers of transacting with non-bank fintech businesses on digital platforms because of a lack of regard for the supposed reputation of traditional banks. Arner et al. (2015) use China as an example; more than 2 000 peer-to-peer (P2P) lending platforms operate without clear regulatory frameworks. Consequentially, millions of Chinese customers use unregulated P2P fintech services and lending platforms borrowing copious amounts of money on such platforms. This is because they are convenient, apparently cheap, and offer potentially good returns. This review argues that even for the undeterred and trusting customer, these benefits require digital readiness from the fintech platforms and regulators alike so that cyber risk mitigation could be built into the DT architecture of fintech (PwC, 2019), particularly while the South African fintech industry is still in its first decade of development.

III. *Industry Environment of Financial Services*

The digital readiness of the entire financial services industry is another important indicator of the digital capabilities the sector has, in order to facilitate customer adoption of mobile fintech adoption in the middle income market. Although South Africa’s financial services are significantly digitalised, particularly in retail banking,

the sector is experiencing major technological disruption (Armstrong, 2019). However, whether the process of changing from analogue to digital has transitioned the industry into complete digital maturity is a complex question due to the changing nature of what constitutes “financial services” today and which parts of its value chain are considered. This question is considered in the present discussion in terms of the ways the industry is fragmented and thus its impact on the industry’s digital readiness.

This fragmentation is the result of industry pockets such as banking that are relatively digitally mature in some aspects, while digital-only banking players and non-bank fintechs are arguably less digitally mature. As such, the digital readiness of new financial services players, like fintechs, arguably cannot fully adapt to mass customer adoption and thus solely further the DT programme.

Greater digital readiness requires for mobile fintech businesses to not only be digital in their products and services, but also be digitally mature in their operations and application of digital technologies. Ultimately, such digitally transformed businesses as defined by Anthony et al. (2017) fulfils both the “how” and the “what” they do business in; however the lack of sufficient data on South African fintechs hampers establishing the extent of DT in the “how” aspect or their internal make-up. This is understandable as most of the new fintech players are start-ups that were five years old or less at the time this study was conducted (Genesis Analytics, 2019).

The traditional banking sector on the other hand is digitally transformed insofar as its digital customer touchpoints (front office) contribute to the “how” aspect of their business (Anthony et al., 2017). However, the “what” aspect (products and services) within incumbent banks are possibly not as digitally transformed or innovative as those of the new non-bank fintech players. Furthermore, the internal DT process of incumbent banks is also fragmented between their front, middle and back offices. For example, African retail banking has taken strides in innovation and digitalising themselves - which are two processes inherent within DT. Despite this, McKinsey reports that although banks are transformed in terms of the digital channels they provide to customers, their back-office operations are not as fully digitised (McKinsey, 2018, as cited in Chironga et al., 2018), and some

operations still take place on a paper-based and manual basis. This underlines that DT should not end at the front office but should filter down to the middle and back-offices of incumbent banks.

This discussion on the digital readiness and DT of two key South African financial services provided contextual and insightful information on DT requirements and the complexity of this industry's environment. It raised questions on the digital readiness of non-bank fintechs to be able to adapt to customer adoption, as well as the uncertainty around the DT gaps within incumbent banks. It is an area that required a review in order to understand the currently fragmented ecosystem in which increased customer adoption of mobile fintech will take place.

2.5.3 *Middle income Market Characteristics*

I. *Defining Middle Income Market*

The middle income market construct in this study is defined in terms of customer income levels and is discussed in more detail in Chapter 3.4.2 where the primary sample is described. However, this construct has various multi-criteria definitions that exist in different academic fields which require exploration within the review. This exploration will discuss the various definitions and approaches for the middle income market construct, and how the selected approach could influence this markets increased adoption of mobile fintech.

Researchers in banking use the terms "midmarket" and "middle-income market" interchangeably, while in the social sciences the term "middle class" is used. This study uses the term "middle income market", viewing it from a financial market segmentation standpoint, adding a social sciences modification by using "middle class" criteria to help contextualise the study in South Africa.

From a financial market segmentation point of view, the middle income market construct is borrowed from McKinsey (Chironga et al., 2018), where it is described as a discrete market segment within retail banking, and income metrics are used to allocate customers into segments. From an economics point of view; Burger et al. (2014) argue that the income variable is also a class variable that

indicates purchasing power in the market by calculating income values of customers. In addition, the middle income market is considered a residual category, meaning that it can be defined in absolute values (Burger et al., 2014), which are in between lower and affluent market segments.

Taking a social sciences stance, Visagie and Posel (2013) produced a widely cited study investigating the “what” and the “who” is in the middle class in post-apartheid South Africa. In a similar finding to this study’s research problem, Visagie and Posel (2013) identified a disproportionately large amount of literature on class inequality and poverty compared to middle class dynamics in the country. Using data from National Income Dynamics Study (NIDS, 2008), Visagie and Posel (2013) found that the middle class was defined either by affluence (20.4% of the population) or income strata (31.6% of the population).

On the one hand, these researchers argued that affluence could only be holistically measured if there was economic stability and prosperity in a country; thus they typically used income, occupation, and socio-economic status as measurement metrics. Using income strata, on the other hand, was a more economically inclusive approach and could be used loosely to define average South Africans. However, using the latter qualifier strategy could result in many households falling into the lower living standard percentile and possibly even below the poverty line (Visagie & Posel, 2013). Thereafter the income strata group could still be defined as middle income, which defeats the purpose of differentiating it as a separate market. Both these approaches discussed by Visagie and Posel (2013) have their pitfalls and neither are perfect measurements, particularly in the historically unequal and politically complex environment in South Africa. Nonetheless, this review needed to discuss these approaches so that customers are qualified based on income metrics that are representative of the selected sample approach.

This study selected a socio-economic approach that is sensitive to the social sciences view by using household values as its main qualifier. In addition, the financial market segmentation definition for the construct of middle income market guides its parameters in this study. Therefore, this study’s clarified approach and definition assists its aim to understand the contributing factors in

increasing and accelerating customer adoption for the middle income market who have purchasing power and the argued digital adeptness.

II. *Financial Literacy in Middle Income Market*

This review argues that financial literacy is a prerequisite for digital financial literacy. Thus, the more financial literate consumers are sets them up for greater customer adoption of digital products such as mobile fintech. Moreover, past consumer banking experiences also indicate financial literacy by providing useful information on their level of engagement with already established digital banking channels.

No standardised method of measuring financial literacy in South Africa exists as many researchers incorrectly conflate exposure to financial instruments, such as having a bank account, as financial literacy (Nanziri & Leibbrandt, 2018). Moreover, when making decisions about activities such as saving, investing and financial planning - a high financial literacy is required which is higher than most mass lower-end market consumers. Therefore, the measure of financial literacy for the middle income market customer needs to be of good competency and skills for such activities. As a result, the basic competencies needed to adopt mobile fintech products and services go beyond owning a bank account.

Nanziri and Leibbrandt (2018) conducted a key study in this area of financial literacy in South Africa. They drew up a financial literacy index, using variables of financial competency and financial knowledge. They took a differentiated quantitative approach which tested generic financial literacy and not specific banking product research, and it reflected the general scope of financial literacy amongst a diverse set of consumers in South Africa across LSM and banking profiles. Amongst other findings, their results showed a pattern among South African customers; they had the knowledge (financial knowledge) but this did not necessarily translate to financial competency or progressive financial behaviour. This was because of factors such as a risk aversion to loss, or a lack of banking experience. Furthermore, Nanziri and Leibbrandt (2018) explained that factors such as economic migration, that is whether consumers lived in rural or urban areas, had a more significant impact on financial literacy than demographic

factors such as race, age or gender. It emerged that factors such as a lack of banking experience and geography influence levels of financial literacy, and are key to understanding how to build digital financial literacy for customers in the middle income market.

Deloitte's (2019) report on South African consumer payment behaviour confirms Nanziri and Leibbrandt (2018) findings, where a lack of banking behaviour indicated low financial literacy. This finding was due to a lack of traceable banking activity. It was also found that 80% of South African customers immediately withdraw their money from their bank accounts as soon as they receive it (Deloitte, 2019) and use cash instead. Despite these subjective findings bound by the set of customers surveyed, the prevalence of cash-based transactions still proves to be valuable information as it provides another dimension into the lack of financial literacy across multiple customer markets. This dimension could reside in consumer decisions to continue transacting within in a cash-based economy as opposed to using mobile fintechs or banking options that are available to them.

Furthermore, this finding that 80% of payments in South Africa are cash-based highlights how cash is still preferred by the banked population (Deloitte, 2019). Since the majority of middle income customers are banked, this means that the found withdrawal rate and resulting cash use includes this market. Therefore, digitising of the prevailing cash economy and developing better digital financial literacy within middle income market customers, to conduct financial activities on digital platforms remains a challenge. It is challenging as both these factors are integral to increasing the customer adoption of mobile fintech.

Since the recent introduction of digital-only banks such as Tyme Bank, Discovery Bank and the impending Digital Zero, the South African financial services market has seen considerable changes in the competitive landscape of digital banking. Accordingly, it was hoped that reviewing the industry market-share of digital banks would assist in determining the current level of digital-only financial behaviour of middle income market customers.

Capitec has a recorded 6,5 million digital clients and Tyme Bank has 740 000 accounts (Whitfield, 2019). However, less than half of Tyme Bank accounts are active. These two examples are limited for middle income market application - as neither Capitec nor Tyme Bank necessarily serve a diverse range of customer markets, and mainly offer basic financial products. Regardless of the limitations, Tyme Bank shows a lack of digital customer engagement, while Capitec's digital client base shows more promising active account-holder numbers, although the active versus inactive numbers have not been released publicly.

So far, the shake-up in the digital-only banking market has mainly been affected by the increased range of entry level digital bank accounts. Despite this increase; however, advanced products such as credit, housing and vehicle financing (Moyo, 2019) are still sourced by customers from the five incumbent banks in the country. Moyo (2019) sees the adoption of these advanced banking products as the behaviour of primary banking customers (Moyo, 2019), which indicates higher financial literacy amongst such customers.

Meaning that customers with high financial literacy are shown by their adoption of advanced financial products and services. This creates a dual-reality where financially literate customers, like middle income customers, are both high-cash users with traceable banking activity exemplified in their use of advanced banking products and services. The challenge here lies in mobile fintechs, which include digital-only banks, to understand why financially literate customers have not yet widely adopted their digital-only products for advanced financial activities.

2.6 Conclusion of Literature Review

In conclusion, this chapter has provided a discussion of the literature with the objective to firstly examine the barriers and facilitators to middle income market customers adopting mobile fintech products and services. Secondly, to explore the relationship between digitally transformed customer behaviour and customer adoption of mobile fintech in the middle income market.

The first research objectives review included a comparison of case studies from emerging economies. Thereafter, the important intersection between mobile phone communications and fintechs was explored in different customer markets.

The second research objectives discussion reviewed literature around the digital readiness of middle income market customers and the greater mobile fintech industry. This was done to firstly understand middle income market customer behaviour in terms of their current banking patterns, digital segmentation profiles and financial literacy. Secondly, the local mobile fintech industry was also discussed to contextualise current industry conditions.

This review formed the basis of the below research questions. Chapter 3 will discuss the research methodology used to operationalise the below research questions.

2.6.1 *Research Questions*

The first three research questions of this study relate to Research Objective 1 which examines the customer adoption barriers and facilitators of mobile fintech in the middle income market.

i. ***Research Question 1:***

What are the middle income market's adoption barriers and facilitators of mobile fintech?

ii. ***Research Question 2:***

How do the qualitative findings further explain the customer adoption barriers of mobile fintech according to middle income market customers?

iii. ***Research Question 3:***

What factors influence the customer adoption of mobile fintech in the middle income market?

Research question 4 below relates to Research Objective 2 which explores the relationship between digitally transformed customer behaviour and the customer adoption of mobile fintech in the middle income market.

iv. ***Research Question 4:***

Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech?

The consistency matrix in Appendix A details the methodologies and analysis approach for each research question.

2.7 Hypotheses for Research Question 1

This section presents and discusses the hypotheses that were developed to address research question 1 which asked: "*What are the middle income market's adoption barriers and facilitators of mobile fintech?".* This study used the technology acceptance model: the UTAUT-TAM, to address this question. This model's part in the research instrument is discussed in the methodology section 3.3.1.

The independent variables (IV) from the UTAUT-TAM model helped this study identify and examine the barriers and facilitators to the customer adoption of mobile fintech in the middle income market. Customer adoption is indicated with the model's dependent variables (DV) of behavioural intention (BI) and behavioural use (USE). The ten IV's and two DV's are discussed below with their relevant hypothesis statements.

2.7.1 *Selected Barriers and Facilitators:*

Each IV was hypothesised as either positive predictors (facilitators) and others were negative predictors (barriers) to customer adoption. Therefore, five of the IV's were hypothesised to have negative barrier relationships, and five other IV's were hypothesised to have positive facilitator relationships to BI.

The proposed five IV to have negative barrier relationships to BI were:

- Trust (TR)
- Facilitating Conditions (FC)
- Security (SEC)
- Risk (RI)
- Attitude (ATT)

These five IV were selected to be barriers firstly because of the security-related nature of RI, TRU and SEC, which is supported by literature on the security and privacy concerns (Aguidissou et al., 2017) of customers considering to use financial technologies. Secondly, FC was also included because of the need to consider whether middle income customers perceived themselves as externally enabled enough to use mobile fintech. Lastly was ATT, which Khalilzadeh's et al.

(2017) research results found to be the most influential construct in the intention to use NFC mobile financial technology. Therefore, these five constructs became the proposed barrier constructs as they were regarded as the most significant impediments facing the middle income customer's adoption of mobile fintech.

The proposed five IV to have positive facilitating relationships to BI were:

- Effort Expectancy (EE)
- Hedonic Performance Expectancy (HPE)
- Utilitarian Performance Expectancy (UPE)
- Social Influence (SI)
- Self-Efficacy (SELF)

The above variables were the positive predictors and proposed as facilitating determinants of middle income customer intentions to adopt mobile fintech.

2.7.2 *IV Hypotheses*

The ten IV's from this study's modified UTAUT-TAM model are discussed below with their hypotheses statements:

I. Effort Expectancy (EE) – proposed facilitator

EE was originally derived from the TAM (Davis, 1989) and is the consumers perceived ease of use of a technology. Since then, multiple UTAUT versions have validated EE as a powerful predictor of behavioural intention, particularly in mobile banking (Merhi et al., 2019). As such, EE was measured by perceptions of how much or how little effort was required for customers to adopt mobile fintech. Subsequently, the following EE hypothesis was proposed:

H1: Effort Expectancy (EE) will have a positive influence on behavioural intention (BI) to use mobile fintech.

II. Facilitating Conditions (FC) – proposed barrier

FC is defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p. 453). In this study, FC indicated the customers' perception of the

availability of support structures such as data, knowledge, or ICT network infrastructure, for example, to enable customers intention and usage of mobile fintech. This study measured such factors as influential and as negative barrier relationships to BI. The motive in FC's selection was to ascertain how enabled middle income customer perceive themselves to be in terms of their access to data, knowledge etc. Thus, the hypothesis below:

H2: Facilitation Conditions (FC) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech.

III. Hedonic Performance Expectancy (HPE) - proposed facilitator

Various m-commerce scholars in Lebanon and England found HPE to be one of the key determinants of customer adoption, mainly because consumers perceived mobile phones as devices of entertainment (Merhi et al., 2019). Therefore, the perceived pleasure or fun factor of a mobile fintech could influence middle income customer intentions. Consequentially, HPE is hypothesised to have a positive influence on behavioural intention. The HPE hypothesis statement is:

H3: Hedonic Performance Expectancy (HPE) will have a positive influence on behavioural intention (BI) to use mobile fintech.

IV. Utilitarian Performance Expectancy (UPE) - proposed facilitator

Utilitarian Performance Expectancy is the perceived usefulness of a technology and originally emanates from the TAM model as "perceived usefulness" (Davis, 1989). According to this definition, UPE measures whether potential customers consider a technology as serving a need or purpose in their lives. UPE thus serves as a positive influence on middle income customers' behavioural intentions to use mobile fintech. The hypothesis for UPE is:

H4: Utilitarian Performance Expectancy (UPE) will have a positive influence on behavioural intention (BI) to use mobile fintech.

V. Trust (TR) – proposed barrier

Trust is defined as the "belief that vendors will perform some activity in accordance with customers' expectations" (Shin, 2009, p. 1346). This means that customers need to have a level of good faith that mobile fintech providers will meet their expectations for a service or product promise. Therefore, this construct is highly subjective for customers and also proved to be a highly influential factor in mobile banking (Zhou, 2011). In addition, TR is one of the security related constructs that is together with privacy, risk and security, and thus deemed a potential barrier to BI. TR is then hypothesised as follows:

H5: Trust (TR) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech.

VI. Self-Efficacy (SELF) - proposed facilitator

Self-Efficacy is the customers self-judgement on their perceived level of competency and capability to execute the required tasks to use a technology (Bhatti, 2007). SELF has been validated in a number of technology acceptance studies and financial technology studies of online banking and mobile payments (Wentzel et al., 2013). SELF was thus very relevant to this study in capturing middle income customers' perceptions of whether they could perform on a mobile fintech platform. This self-perception could influence their behavioural intention and thus the influence of SE was hypothesised as follows:

H6: Self-Efficacy (SELF) will have a positive influence on behavioural intention to use mobile fintech

VII. Security (SEC) – proposed barrier

Security is the degree to which customers perceive a transaction, procedure or general technology usage will be secure (Shin, 2009, p. 1346). SEC falls under the security-related family that Khalilzadeh et al. (2017) indicate as pertinent to financial technologies. It was also found to be a hinderance to the use of NFC mobile payments (Bast, 2011). As such, the importance of SEC in this study

suggested it would be a significant influence yet a potential barrier to customer adoption in the middle income market. SEC is hypothesised as follows:

H7: Security (SEC) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech.

VIII. Risk (RI) – proposed barrier

Risk is defined as the customers expected loss involved with the use of a technology (Featherman & Pavlou, 2003), and is thus a potential barrier to intent and usage of mobile fintech. Khalilzadeh et al. (2017), argue that RI has various dimensions within it which relate to performance risk (the risk associated with a technology crashing or becoming faulty whilst in use), and privacy risk (the risk associated with a customer's privacy being compromised and the leaking of their financial information). These multi-dimensions created a reflective RI construct with six question items in this study's questionnaire part that cover both performance risk and privacy risk. Therefore, respondents were asked questions relating to both dimensions. The hypothesis for RI was:

H8: Risk (RI) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech.

IX. Attitude (ATT) – proposed barrier

Attitude refers to the customers feelings, whether good or bad, towards a technology. This definition stems from internal evaluations (Shin, 2009) and psychological sentiments customers have about adopting a technology. Studies by Khalilzadeh et al. (2017) and Liébana-Cabanillas et al. (2019) found that ATT was the most influential construct on customer intent and usage of online payment technologies. Liébana-Cabanillas et al. (2019) defined ATT as a customer's feelings that are significantly impacted upon by the ease of use of the technology and their Self-Efficacy. In the present study, ATT was recognised as an integral predictor and it was hypothesised that it would be a barrier to the adoption of mobile fintech by the middle income market.

H9: Attitude (ATT) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech.

X. Social Influence (SI) - proposed facilitator

Social influence is a social pressure construct (Khalilzadeh et al., 2017). Potential customers are usually persuaded or influenced by peers, family or people they deem significant to use a technology. SI was measured by the extent to which such social influences were perceived by middle income customers to be determinants of their behavioural intention to use mobile fintech. The hypothesis is as follows:

H10: Social Influence (SI) will have a positive influence on behavioural intention (BI) to use mobile fintech.

2.7.3 *DV Hypotheses*

Behavioural Intention (BI) and Behavioural Usage (USE) were the two dependent variables in this study's modified UTAUT-TAM model. A key relationship between BI and USE was hypothesised:

I. Behavioural Intention (BI)

BI is defined as the customers' perception on their possible intent to utilize the technology (Alshehri, 2012). This study measured BI as the only construct that could explain and predict customer usage of mobile fintech. Therefore, the hypothesis was:

H11: Behavioural Intention (BI) will have a positive influence on the usage (USE) of mobile fintech.

II. Behavioural Usage (USE)

USE represents a customer's practical use of a technological system. Venkatesh et al. (2003) validated the direct relationship between BI and USE in the original UTAUT model. The middle income market's USE of mobile fintech is predicated by BI as stated above, and was measured separately to test this relationship.

2.7.4 *Moderator Hypotheses*

This study's modified UTAUT-TAM model had three moderators to improve the explanatory power of the barriers and facilitators of customer adoption in this market. These were Middle Income Market (MIM) and Age (both sociodemographic variables), as well as Digital Profile (a behavioural and customer segmentation variable). These moderators moderated three of the proposed IV's of Facilitating Conditions (FC), Utilitarian Performance Expectancy (UPE) and Trust (TR). Adapting the UTAUT-TAM model to suit a particular context was suggested as necessary because of the limitations such global models may have when transferred to different non-organisational contexts and different consumer studies (Merhi et al., 2019) such as this one. Thus, this study measured the moderation effects that MIM, AGE and DIGIP had on the below hypothesised relationships. These moderation effects explain the strength or weakness of each stated relationship. This moderator hypothesis statements were as follows:

I. **Middle Income Market (MIM):**

H2a: FC – BI to use mobile fintech is moderated by middle income market (MIM) construct

H4a: UPE - BI to use mobile fintech is moderated by middle income market (MIM) construct

H5a: TR – BI to use mobile fintech is moderated by middle income market (MIM) construct

II. **Digital Profile (DIGIP):**

H4b: UPE - BI to use mobile fintech is stronger for users with highly digital behavioural activity and digital history, than users with low digital behavioural activity and digital history.

III. **Age (AGE):**

H4c: UPE - BI to use mobile fintech is stronger for younger users than older users.

Table 2.1 below summarizes the research hypotheses in the modified UTAUT-TAM framework depicted in Figure 3.2.

Table 2.1: Summary of UTAUT-TAM hypotheses

Hypothesis	Description
H1	Effort Expectancy (EE) will have a positive influence on behavioural intention (BI) to use mobile fintech
H2	Facilitation Conditions (FC) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech
H3	Hedonic Performance Expectancy (HPE) will have a positive influence on behavioural intention (BI) to use mobile fintech
H4	Utilitarian Performance Expectancy (UPE) will have a positive influence on behavioural intention (BI) to use mobile fintech
H5	Trust (TR) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech
H6	Self-Efficacy (SE) will have a positive influence on behavioural intention (BI) to use mobile fintech
H7	Security (SEC) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech
H8	Risk (RI) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech
H9	Attitude (ATT) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech
H10	Social Influence (SI) will have a positive influence on behavioural intention (BI) to use mobile fintech
H11	Behavioural Intention (BI) will have a positive influence on the usage (USE) of mobile fintech
	Moderator Descriptions
H2a	FC – BI to use mobile fintech is moderated by middle income market (MIM) construct
H4a	UPE - BI to use mobile fintech is moderated by middle income market (MIM) construct
H5a	TR – BI to use mobile fintech is moderated by middle income market (MIM) construct
H4b	UPE - BI to use mobile fintech is stronger for users with highly digital behavioural activity and digital history, than users with low digital behavioural activity and digital history.
H4c	UPE - BI to use mobile fintech is stronger for younger users than older users

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Research approach

This research study took a pragmatic mixed method approach, using both quantitative and qualitative methods in a converged design (Creswell & Creswell, 2018). The purpose of the mixed method approach was to achieve a holistic and full understanding of the middle income market as the study unpacks the factors that contribute to their adoption of mobile fintech. There were two motivations for the choice of a mixed methods approach.

Firstly, previous studies that have employed the UTAUT-TAM model (Khalilzadeh et al., 2017), like this study has, used a single quantitative research methodology; however, with the insights gained in this study's literature review, it was deemed necessary to undertake a mixed method approach for a complete and context-specific understanding (Creswell & Creswell, 2018) of customer adoption in the South African middle income market context. Secondly, using the qualitative aspect within the mixed method approach ensured that new possible factors, outside of the quantitative UTAUAT-TAM model, that impact customer adoption were explored.

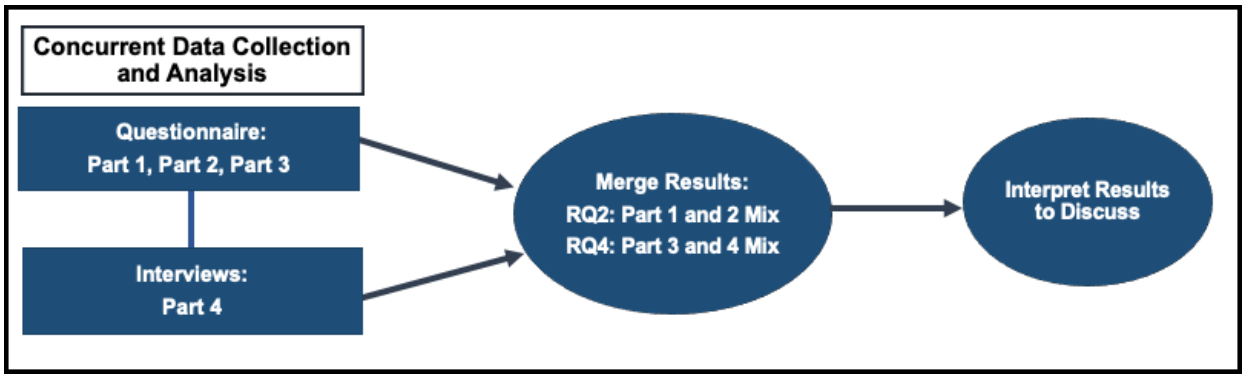
Despite two different methods used, Kaplan and Maxwell (2005) argue that the mixed approach allows for the results to be generalised (Kaplan & Maxwell, 2005). Moreover, this comparative approach would allow further qualitative dimensions to be revealed by allowing the respondents an opportunity to voice their ideas about mobile fintech and the customer behaviours from this market. These were additional salient considerations that needed to be included in this study. The quantitative and qualitative methods would ultimately both ensure the significance of this study is achieved, by conducting a customer insights-driven enquiry. Furthermore, the middle income market as a study population has not been specifically addressed in fintech research because the novel field of fintech has only developed over the last decade (Puschmann, 2017). This study has taken the opportunity to conduct research on this population.

The core philosophical assumption of the mixed methods approach was also acknowledged in this study; that is, by using multiple data sets, the study would provide more information than a single methodology could yield for the study (Creswell & Cizek, 1999). This assumption will not detract from the mixed methods approach this study used. Owing to the novelty of fintech research and the context of the selected population, it was necessary in this study to broaden the instrument and research scope to address the topic effectively.

The mixed method approach was operationalised through triangulation, which used multiple reference points to find consistencies or variances (Creswell & Cizek, 1999) within a multi-part research instrument. The research instrument discussed in this chapter and provided in Appendix F and Appendix H demonstrate the different methods used to examine, asses and explore the two datasets obtained to answer the research questions.

3.2 Research design

Figure 3.1: Convergent Design (One-Phase Design) sourced from Creswell & Creswell (2018, p. 352)



This study adopted a convergent research design. As per Figure 3.1 above, the data collection and analyses were separate processes yet took place concurrently. The mixing or merging only took place after the data collection and analysis stage. The convergent design was considered the best approach as the multi-part instrument was designed with parallel variables or concepts (Creswell & Creswell, 2018). In this way, instrument parts 1 and 2 had parallel variables so that interpretation was possible. Similarly, instrument parts 3 and 4 had parallel concepts and thereby enabled their discussion.

Moreover, the convergent design assisted the research questions to be addressed in each part of the instrument. The explanation below (section 3.2.1) specifies how the research questions were linked to the instrument parts:

3.2.1 *Research question linkages in research design*

- **Research question 1. asks**; RQ1: *What are the middle income market's adoption barriers and facilitators of mobile fintech?* There was a link between this question and instrument Part 1 UTAUT-TAM items. The part 1 results were analysed in Chapter 4, and discussed separately in Chapter 5 to answer RQ1.

- **Research question 2 asks;** *How do the qualitative findings further explain the customer adoption barriers of mobile fintech according to middle income market customers?* This question related to Instrument part 2, which sought to deepen this study's adoption barriers results. These barrier questionnaire findings were presented in Chapter 4, and their interpretations were discussed in a mixed approach together with the quantitative UTAUT-TAM results (Instrument Part 1) in order to answer RQ2.

- **Research question 3. asks;** *What factors influence the customer adoption of mobile fintech in the middle income market?* This question linked to the Instrument Part 4 semi-structured interviews. These interview findings were separately analysed in Chapter 4. The findings are discussed separately in Chapter 5 to answer RQ3.

- **Research question 4. asks;** *Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech services?* This question is linked to Instrument Part 3 open-ended questionnaire items, where this study sought to understand the extent of digital transformation in the middle income market's digital customer behaviour. Moreover, how these digital behaviours link or do not link to the adoption of mobile fintech is the crux of the question. These open-ended questionnaire findings are analysed separately in Chapter 4, and their interpretations are done in a mixed

discussion with the semi-structured interview findings (Instrument Part 4) in order to answer RQ4.

A summary of how the research questions and objectives were designed is provided in the consistency table (Appendix A) and concisely shows the research design.

The disadvantage of this design and mixed approach was the complexity of evaluating the mixed data. Creswell and Wisdom (2013) caution researchers to carefully plan and describe the qualitative and quantitative portions so that data integration is manageable. However, the advantage of a convergent design is that it does not combine the data at the analysis stage, therefore allowing for each data set to be separately analysed before integration and interpretation. An additional advantage is how the participants' voices from the qualitative data, add descriptors and perspectives to enrich the study (Creswell & Wisdom, 2013).

3.3 Multi-part research instrument

This study replicated a methodology structure that uses a multi-part instrument within a mixed method approach from Alshehri (2012), who researched customer adoption of e-government services in the Kingdom of Saudi Arabia. In the present study, a reduced and amended version of Alshehri's (2012) research methodology and instrument structure was applied to develop a comprehensive instrument that suited the convergent design and mixed method approach for a South African context.

Two amendments to Alshehri's (2012) original research approach were made to this study's instrument. Firstly, this instrument used the integrated UTAUT-TAM model instead of the UTAUT model alone. Secondly, the focus groups for part 4 in the research instrument were removed and replaced by subject-matter expert interviews. In summary, the first part of the instrument remained quantitative (UTAUT-TAM model) and the other three parts (barrier instrument, open-ended questions and semi-structured interviews) remained qualitative. The aim of this multi-part instrument was to provide insightful depth to this study's research objectives.

I. Research Instrument Parts

The purpose of each instrument part is described below:

- **Part 1:** UTAUT-TAM multi-item scale instrument (quantitative) was the primary tool to address research objective 1, and resulted in key barriers and facilitators to the customer adoption of mobile fintech.
- **Part 2:** Barrier instrument (qualitative) identified priority barriers and served as a comparative tool to the UTAUT-TAM results on adoptive barriers.
- **Part 3:** Open-ended questions (qualitative) identified the level of mobile fintech penetration from the customers perspective in the middle income market.
- **Part 4:** Subject matter expert interviews (qualitative) with individuals who work directly with or serve mobile fintech customers provided a mobile fintech industry perspective.

3.3.1 *Part 1: UTAUT-TAM model*

An internal psychological evaluation process takes place prior to a customer's adoption of a new technology in their consumer behaviour. This has seen the emergence of multiple technology user adoption models, used by researchers in various contexts to confirm which latent evaluation factors positively or negatively influence customer adoption.

This study used a multi-part research instrument that included a technology user adoption model, namely an extended Unified Theory of Acceptance and Use of Technology (UTAUT) model combined with the Technology of Acceptance model (TAM) to create an integrated model called UTAUT-TAM (Khalilzadeh et al., 2017). The UTAUT-TAM is a quantitative instrument that measures latent independent variables to measure customer adoption through the dependent variables of behavioural intention (BI) and behavioural usage (USE). Therefore, these dependent variables were used as indicators of customer adoption.

All ten of the original latent UTAUT-TAM variables were used in Part 1 of this study's research instrument: risk (RI), security (SEC), trust (TRU), attitude (ATT),

facilitating conditions (FC), effort expectancy (EE), self-efficacy (SELF), social influence (SI), hedonic performance expectancy (HPE) and utilitarian performance expectancy (UPE) (Khalilzadeh et al., 2017). Each of the total twelve UTAUT-TAM variables in the instrument contained 3 statements, except for the RI variable, and respondents ranked each one according to their level of agreement or disagreement. These responses were indicated on a five-point Likert anchor scale ranging from 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) and 5 (strongly agree).

I. Justification for UTAUT-TAM model

In the area of financial technologies; Khalilzadeh et al. (2017) developed an integrated technology user adoption model on the customer adoption of near-field-communication (NFC) mobile payments in restaurants. Similar to the present study, Khalilzadeh's (2017) model was located in the financial technology context and verified, which was one of the reasons it was deemed an appropriate model for the quantitative instrument part of this study (Part 1).

A second reason for using the UTAUT-TAM model in this study is that it has been developed from other well established models, the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Social Cognition Theory (SCT) to name a few (Khalilzadeh et al., 2017). Khalilzadeh et al. (2017) made changes and extended these models to create an integrated model that assesses customer adoption of NFC mobile payments.

The changes included replacing Performance Expectancy with Attitude from the TAM (Davis, 1989), adding Self-Efficacy and security related constructs such as Trust, Risk and Security. Use Behaviour was also removed. As a result, the UTAUT-TAM has a unique sequential flow borrowed from Mohammadi (2015) where five independent variables and five mediators are shown to lead to the intention to adopt NFC payments technology. The sequential choice was justified by a sequential logic embedded in the TAM model. Moreover, the removal of Attitude and addition of security-related constructs was justified by the importance of these constructs as key determinants in customers' acceptance of

financial technologies, particularly for payments (Khalilzadeh et al., 2017). Although the mediators were removed, this study remained close to the UTAUT-TAM model and chose it above other UTAUT or TAM model versions as the above construct amendments and expansion changes were key contemporary updates, that captured influential IV determinants to the customer adoption of mobile fintech in the South African middle income market context.

The diffusion of innovation (DOI) theory was considered as an alternative research model, but Roger's DOI (2010) model could not be culturally translated to contexts outside its country of origin, the USA. Furthermore, DOI is primarily a descriptive tool whereas UTAUT-TAM has explanatory and predictive power when appropriately applied (Clarke, 1999) to a context. This was a further reason to select the UTAUT-TAM as the base model for measuring customer adoption of mobile fintech in the present study.

II. Part 1: Modifications to UTAUT-TAM model

Figure 3.2: Proposed quantitative research model

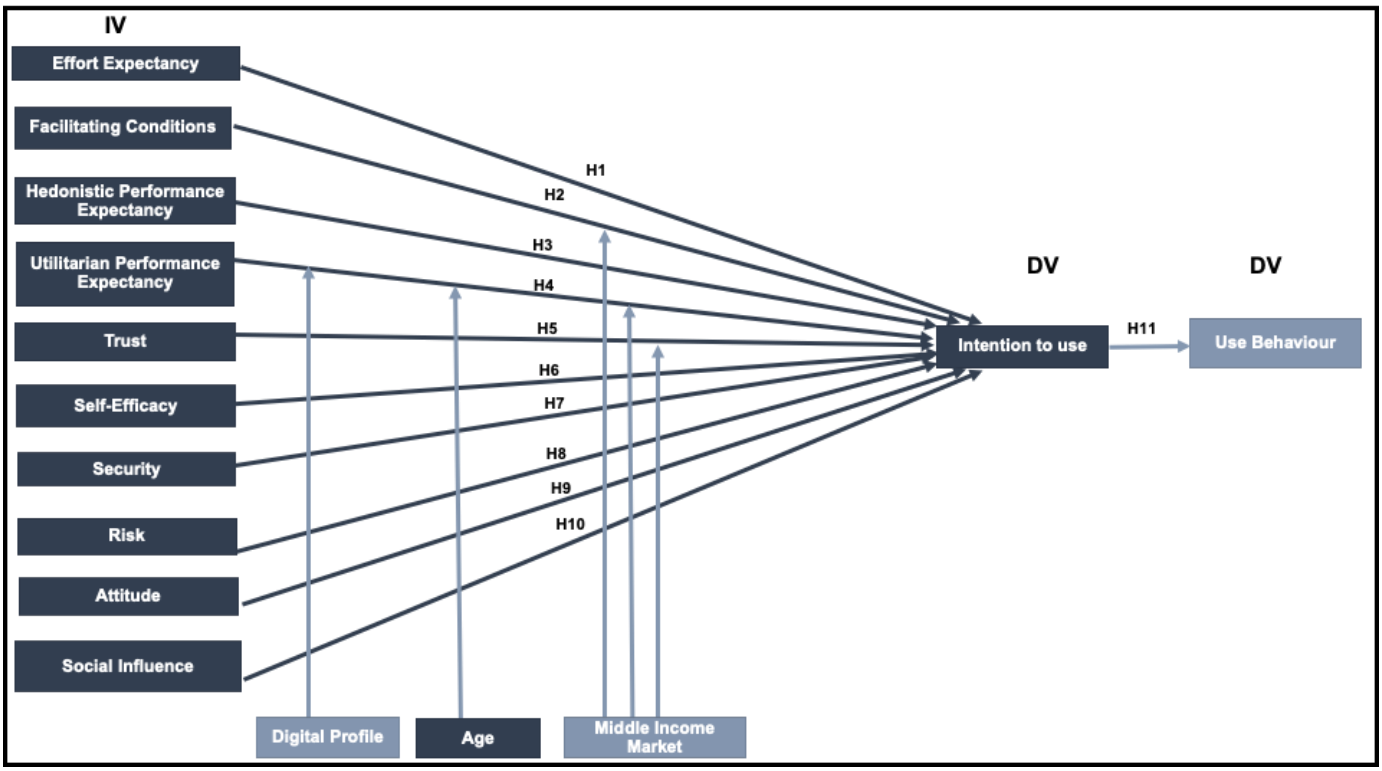


Figure 3.2 illustrates this study's proposed quantitative model based on the UTAUT-TAM model. All ten independent variables remain, and two model modifications were made. Firstly, two of Khalilzadeh's (2017) original moderators, namely gender and previous experience were changed to middle income market (MIM) and digital profile (DIGIP). Although data on respondents' gender and previous experience variables were collected, these variables were used instead to analyse the primary sample demographics and not to moderate the model relationships. Therefore, this study focused on the middle income market, digital profile and age as moderators, as these were more relevant to research objective one. Secondly, Behavioural Usage (USE) was included as an additional dependent variable to behavioural intention (BI) so that the actual usage of mobile fintech could be assessed as apart of customer adoption.

- **Digital Profile moderator (DIGIP):**

The Digital Profile (DIGIP) moderator was a new addition to this study's UTAUT-TAM model and moderates ATT-BI and UPE-BI relationships. Digital profile segment and internet experience created two data points to inform DIGIP. The first data point for the digital profile segment was measured by requesting respondents to categorise themselves in one of four digital segments i.e. Digital Natives, Digital Immigrants, Digital Aliens or Digital Laggards (Kaufman, 2011). The second data point categorized respondents according to their internet experience. Alshehri (2012) used internet experience instead of Venkatesh et al.'s (2003) previous experience moderator, as this was a better moderator of the independent variables. Hence, this study preserved internet experience as a data point, because it works in conjunction with digital profile segment.

- **Middle Income Market moderator (MIM):**

The middle income market (MIM) moderator was the second additional moderator and served as a qualifier tool for respondents. MIM moderated the three hypothesis relationships of FC-BI, TRU-BI and UPE-BI, which is more than the other two moderators. Technology acceptance studies in global contexts with the UTAUT as the basis of their quantitative enquiry, also use income as a socio-economic moderator. Examples include Tiruwa et al. (2018) in the e-commerce

field and Paccoud et al. (2021) in digital health technology research. Both studies posit income as an influential moderator on customer adoption, as different income segments perceive technologies differently and also display varying use behaviours (Tiruwa et al., 2018).

- **Behavioural Use dependent variable (USE):**

Behavioural Use (USE) was added to this study's modified version to measure the relationship between customers intention and actual usage of mobile fintech. This relationship occurs in the original UTAUT model, however Khalilzadeh et al. (2017) removed USE from the integrated UTAUT-TAM as a result of the finding in a prior study that the intention to use had a highly positive relationship with USE. Intention was used instead as a proxy for actual use (Khalilzadeh et al., 2017). In contrast, this study included USE as a dependent variable with a hypothesised relationship to BI because of the study's context. This modification was to allow the study to test the proxy assumption in order to confirm or disprove if customers intention indeed leads to usage.

3.3.2 *Part 2: Barrier Instrument*

Initially developed by Alshehri (2012), this instrument part 2 (Table 3.1) was a qualitative component in the Qualtrics questionnaire that customers completed. Respondents read a statement related to a barrier to customer adoption, and selected according to one of these categories: "not a barrier", "an important barrier" or "a very important barrier".

This part had a total of 14 items with barrier statements that were developed from the literature review. Statements were then refined further by the researcher after the questionnaire had been piloted. As per the cases identified in reviewed studies of developing countries, customer adoption obstacles in the way of digital financial services included various social, cultural and economic factors. Some of these factors were a lack of cultural nuances such as language (Bick et al., 2020), a lack of digital security assurances (Sigurdsson et al., 2015) and a lack of cohesive partnerships between different arms in the financial services industry (Burns, 2018).

Table 3.1: List of barriers to customer adoption

No.	Barrier Statements	UTAUT-TAM constructs
BA1	Lack of user digital literacy to navigate and interact on mobile fintech applications.	Self-Efficacy
BA2	Lack of user knowledge about mobile fintech applications.	Self-Efficacy
BA3	Lack of different user language options (e.g. vernacular) available on mobile fintech applications.	Facilitating conditions
BA4	Lack of internet connection and/or smart phones to use mobile fintech applications.	Facilitating conditions
BA5	Lack of national policy and regulation for the use of mobile fintech applications in South Africa.	Risk (Privacy)
BA6	Lack of partnership and collaboration between mobile fintech services and traditional banks in South Africa	Trust
BA7	Lack of privacy of personal information on mobile fintech applications	Risk (Privacy)
BA8	Lack of technical support (e.g. robo-advisors / chatbots) on mobile fintech applications.	Facilitating conditions
BA9	Lack of security assurances (a pop-up screen with T&C's) to advise the security controls used on the mobile fintech application.	Security
BA10	Lack of online peer reviews for mobile fintech applications.	Social Influence
BA11	Lack of positive customer sentiments towards using mobile fintech applications.	Attitude
BA12	Lack of useful benefits in using mobile fintech applications.	Utilitarian Performance Expectancy
BA13	Lack of fun or entertainment factor to using mobile fintech applications.	Hedonic Performance Expectancy
BA14	Lack of willingness to learn how to use mobile fintech applications.	Behavioural Intention

Table 3.1 above demonstrates the 14 barrier statements that customers responded to. Each barrier statement corresponds to a relevant independent variable (IV) in instrument part 1 of the UTAUT-TAM items. This was intentional in the design of the barrier statements to enhance the mixed interpretation in this study's mixed method approach (Creswell & Creswell, 2018). Eleven out of the twelve variables had been used for this purpose, barring the USE variable.

3.3.3 *Part 3: Open-Ended Questions*

This part was the last questionnaire section that customers completed on the Qualtrics platform. Instrument Part 3 (Appendix F) was designed with four questionnaire items to help the study understand respondents' digital and financial behaviour. Therefore, each item asks customers current and anticipated mobile fintech engagement, and these were developed with the aim of partially addressing research objective two.

Having respondents comment in their own words provided insight into their experiences of mobile fintech and allowed for possible negative or contrary data (Patton, 2002) to emerge. Thus, giving voice to customers would illuminate the semi-structured interviews (instrument Part 4) during the mixed discussion, where the proposed link between customer digital transformation and their adoption of mobile fintech was explored.

3.3.4 *Part 4: Interviews*

In order to gain access to the necessary subject matter experts, emails were sent with a covering letter requesting permission for an interview (Appendix B). The interview guide had 21 items (Appendix H) that were aimed at addressing both the research objectives and questions. The participants that accepted the invitation signed consent forms (Appendix C). The interviews were semi-structured and the guide provided scope for open discussions to allow for further probing, as advised in qualitative research (Merriam, 2009, p. 101). The interviews satisfied the Part 4 component of the research instrument, which was pursued to enrich and expand on the open-ended customer responses in Part 3 of this instrument.

3.4 Population and sample

3.4.1 *Population*

The primary population of interest targeted in this study was a large consumer group of middle income market customers who were South African, owned a smart phone and were part of households with the required per capita income threshold (the latter requirement is defined in the sample details below). The secondary population of interest was subject matter experts questioned in the interview component of the study.

3.4.2 *Sample and sampling method*

I. Primary sample: middle income market *(Part 1 -3)*

This study aimed to receive a minimum sample of 165 respondents, owing to the amount of data points required to produce a reliable data set. This number was calculated following to Tinsley and Kass (1979) recommendation to have five to ten respondents per variable. Since this study's questionnaire instrument had 33 total variables (Appendix F), a minimum of 5 respondents for each variable equalled 165 respondents. This study achieved a sample size of 216 usable responses through a snowballing sampling method.

Snowballing is a non-random sampling technique that uses the initial sample group who have completed the questionnaire to refer or recruit other participants (Terrell, 2015). In this way, a snowball effect takes place and creates a larger sample and opens the study to respondents who would otherwise been overlooked. In this case, initial respondents were encouraged to send the questionnaire link to potential respondents in their household creating a snowball effect.

The targeted sample for this study was middle income market South African customers who use mobile fintech. The first key criterion of qualifying for this sample required respondents to achieve a minimum household monthly income of R3 656,00 after tax deductions.

The study notes that it was due to the contested nature of middle income market values and required qualifiers, that the initial mean upper threshold of R10 000 per head, and a lower individual threshold of R3 656,00 per head were departed from. The initial lower threshold amount was informed by Visagie and Posel (2013). The second key criterion used to qualify respondents for this primary sample was meeting the maximum upper household threshold of R 25 000 for middle income market customers. The departure from Visagie & Posel's (2013) values was motivated by the fact that they are almost a decade old, and their ability to capture this market came into question during this study's data collection phase.

Hence, the sampling qualifiers re-aligned with the socio-economic approach, raised in the literature review, and selected the monthly household income of R3 656,00 after tax deductions to qualify respondents. This study found the need to reconsider the current socio-economic realities that South African customers in this market face in terms of living costs, racial factors and the possibility that income might not be equally distributed within a household.

This study's re-evaluation of its sample qualifiers was drawn from more recent Statistics SA (2020) literature that depicted a different picture for this market, where monthly middle income values mean different things according to customer racial groups. Statistics SA (2020) states: "the mean real earnings between 2011 and 2015 amongst employed black Africans was R6 899 (real earnings) per month. For coloureds and Indians/Asians, the corresponding figures are R9 339 and R14 235 per month, respectively. Amongst whites, it was R24 646 per month" (Statistics SA, 2020).

The Middle Income Analysis Table (Appendix G) shows the qualifiers and disqualifiers used to screen the sample into the market. The selected approach evidently broadened the middle income market sample for this study. Chapter 5 (section 5.2) discussed the achieved sample characteristics in more depth.

In addition, another key qualifier this study used was to target middle income customers who use mobile fintech applications. This was factored into the data screening and management procedures.

II. Secondary sample: Interviews (Part 4)

A sample of four subject matter experts was interviewed for Part 4 of this study's research instrument. Two of the experts were from within the fintech industry, and the remaining two had advisory and state-related roles in the South African fintech industry. It was a criterion for selection that the participating interviewees were experts in their respective fields. Of the 25 identified interviewees, four interviews were conducted. The other potential interviewees could not participate for various reasons.

3.4.3 *Demographics of Primary Sample*

The demographic profile of the respondents for the questionnaire Parts 1 to 3 were South African middle income customers who used mobile fintech.

The study selected to include upper middle income customers who earned monthly incomes of R25 000 and above. These respondents made up most of the sample (48%). The initial upper limit of R10 000 per head proved to disqualify too many respondents and raised questions around the study's qualifiers for middle income customers. These questions remained contested as are the ongoing debates in academia around class, race, and equality in South Africa.

Despite this, the main assurance this study can provide is that almost 90% of the sample could be categorised as middle income as these individuals earned above the minimum threshold of R3 654. The remaining 10% of respondents who earned below the minimum individual income threshold were allocated as middle income because the monthly income of their combined household was above the minimum threshold.

Regarding middle income market customers experience with mobile fintech. Most respondents commented on their mobile fintech use in terms of mobile banking experiences (42%), and not enough respondents had experience of a variety of mobile fintech segments such as insurance or investments like cryptocurrency. Therefore, this study's sample would have been richer should more customers with different types of mobile fintech experience been acquired.

3.5 Validity and Reliability

3.5.1 *Reliability (Part 1 – 3)*

One definition for reliability is that it is a necessary requirement to ensuring a research instrument is able to produce identical results should the research be repeated (Walliman, 2005) under the same circumstances. Another definition which is specific to technology user adoption studies such as this one describes reliability as the consistency with which an instrument can prove that each variable will achieve its intended outcome (Alshehri, 2012). This study therefore aimed to produce consistent results through the research instrument.

The Likert scale items in Instrument Part 1 underwent the internal reliability test, by computing the Cronbach's Alpha α) value, where the scale values needed to be between 0 and 1 to be reliable (Creswell & Creswell, 2018). A Cronbach Alpha α) value which exceeds .70 is an acceptable threshold and meant that the research items were intercorrelated and thus reliable. Moreover, this study's modified UTAUT-TAM model underwent confirmatory factor analysis (CFA) tests and its item questions proved it to be highly reliable.

Part 2 and 3 of this study's research instrument is not as widely used in research compared to Part 1 due to the unique nature of the study. However this multi-part questionnaire design is replicated from two international studies, one conducted by Alshehri (2012) and the other by Wolff et al. (1993). These peer-reviewed studies added to the reliability and dependability of instrument Parts 2 and 3.

3.5.2 *External validity (Part 1 -3)*

Creswell and Creswell (2018) note that sampling is a critical component of external validity, as it demonstrates the extent to which wider generalisability can be obtained. To satisfy this component of external validity, this study used a snowball sampling technique. This is one of the ways the study aimed to ensure that the primary sample could be partially generalised to the wider middle income market population of South Africa.

In addition, during data collection, contrary information was obtained where respondents belonged to middle income households yet did not satisfy the individual income threshold. These were negative or discrepant cases (Creswell & Creswell, 2018) and the researcher reconceptualised such sample cases – as detailed in the sampling method section (Chapter 3.4.2). Such negative cases ran counter to the original understanding of middle income market customers. It was by presenting the negative cases (Chapter 3.4.1) that the study became more valid and practical; despite causing a limitation on the extent of the findings generalisability (Creswell & Creswell, 2018). Therefore, the findings in this study were limited to the sample of middle income market customers.

3.5.3 *Internal Validity*

I. Pilot Pre-Testing (Part 1-3)

In terms of internal validity, the primary questionnaire instrument (Part 1 – 3) underwent a pilot process with 22 participants who completed the questionnaire on Qualtrics. The pilot process was undertaken in order to avoid potential problems later in study (Hundley & Van Teijlingen, 2001). Feedback was collected from the 22 participants who came from the researcher's network of fellow students and academic lecturers. Feedback included suggestions to limit the number of items, to explain the meaning of mobile fintech at the outset, and to reword some items for greater clarity. This pilot process offered an opportunity to strengthen the ease of use and credibility of the questionnaire prior to conducting the main study. The final and refined questionnaire can be found in Appendix F (Instrument part 1 and 3), and Instrument Part 2 can be found in Table 3.1.

II. Member Checking for Credibility (Part 4)

Member checking post the semi-structured interviews was used in this study, firstly to achieve greater research credibility (Morse, 2015) and secondly to ensure that the transcriptions were accurate according to the interviewees themselves. Member checking is a qualitative measure that requires the researcher to verify not only the transcriptions but also the information obtained

from participants during the data collection (Morse, 2015). In this case, the researcher firstly verified the transcriptions with the interviewees, and secondly, used information from the first two interviews to cross-check whether the other two interviewees held different or similar perspectives. Member checking thus became a useful tool to ensure this study's research credibility.

III. Codebook for Credibility (Part 4)

Both Morse (2015) and Fereday and Muir-Cochrane (2006) agree that a coding manual, sometimes called a codebook, provides an essential trail of supporting evidence to demonstrate credibility in qualitative studies. In this study a codebook was created (Appendix J) to manage the qualitative data, to analyse it and achieve credible findings from the semi-structured interviews. Since this study used an inductive Thematic Analysis (TA) approach, the codebook provided structure to code the textual data and group it into categories and eventually themes (Guest et al., 2012). The codebook included a coding system, a coding tree development table and an illustration of how the categories were developed into themes.

3.6 Data collection methods

The data collection process in this study included two procedures for the primary and secondary sample. The primary sample of middle income market customers received a questionnaire, and the secondary sample of subject matter experts were interviewed online.

3.6.1 *Procedures for data collection*

I. Procedure for the primary sample

One questionnaire instrument was administered to the intended primary sample of middle income market customers. This questionnaire was created on Qualtrics and included the three instrument parts, as described in section 3.3.

The University of Witwatersrand has a large population group and provided the study access to the targeted sample group. Moreover, post-graduate students

and staff members had a high probability of meeting the desired sample profile. Once permission had been granted by the University, registered postgraduate students in the database and staff of the Wits Business School were sent an official email via the IT department. A total of 9 000 students and staff received this email requesting their participation.

This email introduced the study's objectives and included a Qualtrics link for potential respondents to complete the questionnaire. The Information Letter (Appendix D) was contained in the email.

When a respondent completed the questionnaire and reached the last window of the site, a page appeared with a request for the respondent to share the link with other adult members of their household. In addition, the researcher also shared the Qualtrics link on social network sites such as LinkedIn, Facebook, WhatsApp and Twitter to extend the reach of this study and encouraged audiences to share the link widely.

II. Procedure for the secondary sample

The procedure of data collection for this study's secondary sample required the researcher to conduct interviews with experts in the field of local mobile fintech. The platform used to reach subject matter experts was LinkedIn Premium and email, which enabled the researcher to send direct messages to various experts who were not established connections.

A total of 25 participation emails or messages were sent to various experts, and six responses were received. The researcher interviewed four of these respondents and thus satisfied the qualitative interview component of the study. These four lengthy interviews were conducted and recorded online, on either Zoom or Microsoft Teams applications.

3.6.2 *Data Screening and Management*

The raw questionnaire data for instrument part 1 – 3 underwent a pre-analysis data screening process before the analysis could begin. This process is used to screen collected data for accuracy, correct outliers and treat missing responses (Levy, 2006).

For questionnaire part 1 which included the UTAUT-TAM items, a total of 339 responses were received and screened for incomplete responses. A total of 123 were removed from the study as part of the data management process. The criteria for their removal were incomplete responses, with those that did not have answers to at least a third of the part 1 section being deleted. The remaining 216 responses were deemed usable in the study.

As far as data screening for the Part 1 section was concerned, data imputation was used to treat a portion of the 216 responses. This measure is used typically to statistically assist and address missing data.

In the case of data screening for instrument Parts 2 and 3, the total number of usable responses for part 2 was 216 responses, and Part 3 was 160 responses. The total number of respondents received for each of these parts varied as some comments were incomplete, blank, or not usable. These were removed and deemed unsuitable for the analysis.

3.7 Data analysis and interpretation

This study's research questions were addressed by analysing the collected data according to the multi-part research instrument, as described in section 3.2.1. The data analysis process involves categorisation, grouping, examination and pulling together of raw data that a study has gathered with the purpose of extracting answers to the research questions (Walliman, 2005). The various procedures in the analysis are discussed in the following sections.

3.7.1 *Part 1: Analysis of UTAUT-TAM*

Once instrument part 1 had been tested for validity and reliability, the analysis for the moderator items and the UTAUT-TAM items were both conducted on R software version 4.0.2.

Firstly, descriptive analytics were used to analyse the moderating variables of age, digital profile, and respondent middle income market position. The three moderating constructs were tabulated according to frequency and percentage to demonstrate the demographic profile and characteristics of the collected data (Alshehri, 2012).

Secondly, the UTAUT-TAM data used structural equation modelling (SEM) which is a multivariate statistical technique used to analyse data. This technique was used to investigate the relationships between variables that were both unobservable (independent variables) and observable (dependent variables) in the UTAUT-TAM model (Hoyle, 2012). The results from the SEM analysis showed path relationships between the variables and the impact of the moderators. These proposed relationship pathways produced standardised path co-efficients (Alshehri, 2012) predicting significant relationships (Wentzel et al., 2013) to analyse probable customer adoption in the middle income market sample. In addition, the three moderating variables of Middle Income Market, Digital Profile and Age played a key role in also predicting the probable outcomes.

The choice of the SEM data analysis approach was generally consistent with other technology user adoption studies that use quantitative methods. Alternative analysis approaches could have been used in the study, such as logistic regression or the partial least squares (PLS) method, to assess and examine the UTAUT-TAM constructs and relationships. However, to avoid high common method variance (CMV), and to remain close to the replicated analysis approach used by Alshehri (2012) SEM was chosen as the approach that would work best in a mixed methodology study that has a multi-part instrument. Furthermore, the original UTAUT version creators, Venkatesh et al. (2012) encourage future studies which aim to reduce CMV to either re-work the variables or manipulate the scales (Venkatesh et al., 2012) - which has been done in this study.

3.7.2 *Part 2: Analysis of Barrier Instrument*

The data from instrument part 2 of the questionnaire were manually analysed through a descriptive data analysis. Using the respondent data which was grouped in a 3-Likert scale, the data was analysed according to the mean values. These mean values provided an average weighting that respondents gave for each barrier statement i.e., “not a barrier” “important barrier” and “very important barrier”. Furthermore, analysis also included the percentages for every barrier statement which respondents’ selected according to their perceived priority.

3.7.3 *Part 3: Analysis of open-ended items*

Content Analysis was used to manually analyse the data from Part 3 of the questionnaire instrument. The four open-ended questions in the questionnaire related to respondents’ current and predicted mobile fintech experiences.

This approach is defined by Merriam (2009) as a form of analytical induction, where qualitative comments are “quantisized” into units of measurements. As explained by Merriam (2009) this form of analysis focuses on the variety and frequency of the data. Despite the perception that using content analysis is sometimes considered a less rigorous qualitative approach because of its quantitative nature, which reduces data into frequencies (Onwuegbuzie & Leech, 2006). Nonetheless, content analysis was deemed appropriate for analysis of the open-ended questions in order to analyse meaning (Merriam, 2009).

The analytical procedure firstly included an analysis of the “yes” and “no” responses according to frequency and percentages. Secondly, the “comment” box responses were manually sorted by the researcher into recurring categories in order to analyse patterns and compare these to respondents’ digital profiles. The latter procedure included using respondents’ prior answers to the digital profile questions in Part 1 of the questionnaire.

Once analysis was complete, the findings from this part were used to address research question 4 and make inferences that would enrich the mixed discussion with the semi-structured interviews (Part 4).

3.7.4 *Part 4: Analysis of Interviews*

Thematic analysis (TA) was used to manually analyse the semi-structured interview data. TA is a realist qualitative approach that is well suited to mixed method studies such as this one because of its theoretical flexibility and the fact that it allows the researcher to code and develop themes organically (Braun & Clarke, 2015).

The aim of using TA was to develop themes that directly addressed research question 3, which was concerned with the factors that influence customer adoption of mobile fintech in the middle income market. In comparison to the closed nature of research question 1, this was a more open question and allowed the researcher to construct an inter-connected narrative (Braun & Clarke, 2012) from the data. Owing to the semi-structured interview structure, the collected interview data included both the expected factors from the interview guide (Appendix H) and the emergent factors that interviewees contributed. The procedure for TA analysis followed six phases as developed by Braun and Clarke (2012):

- **Phase 1: Familiarizing Yourself with the Data:** this was an iterative and immersive phase involving the researcher rereading the transcription data to become more familiar with it.

- **Phase 2: Generating Initial Codes:** The researcher created codes that were keyword identifiers, firstly to label the collected data and also to capture the latent meanings (Braun & Clarke, 2012). This form of coding is also termed analytical coding by Merriam (2009). It is a form of open coding, and not entirely descriptive, where the researcher interpreted meaning from the data to create an initial list of 122 codes for each set of interviews – as exemplified in the coding system.

  The coding system demonstrates two coding tables with internal and external perspectives i.e., interview coding from participants who work within the mobile fintech industry (Appendix J.i), and interview coding from participants who work outside of the mobile fintech industry (Appendix J.ii). Guided by the

interpretation technique by Guest et al. (2012, p. 70), the researcher discerned through the layers of text to collapse the large code list into 49 and 46 coding labels from the internal and external perspectives. These labels, as shown in Appendix J.iv, were then developed into a coding tree table to assist categorization and theme generation for the next phase.

- **Phase 3: Searching for Themes:** The set of coding labels was reduced and grouped into 21 and 19 abstracted categories respectively, which covered the content of the codes. The categories were further collapsed, and 4 themes with 3 sub-themes were generated from recognisable patterns (Appendix J.iii)

- **Phase 4: Reviewing Potential Themes:** it was during the revision phase that themes were discarded or edited to relate more meaningfully to research question 3.

- **Phase 5: Defining and Naming Themes:** in this phase, the researcher refined the themes to ensure that they could not only stand alone but also connect to one another. In this way, the themes formed a conceptual framework for the entire data set from instrument part 4.

- **Phase 6: Producing the Report:** Braun and Clarke (2012) end the TA analysis steps with a need for the analysis to ultimately conceptualise an argument that “goes beyond the data” (p. 67). The researcher followed these steps and created a conceptual framework (Figure 4.3) to make sense of the interview data and ultimately answer research question 3.

3.8 Limitations of the study

The limitations of this study included the following:

I. South African customers who were not related to a university context would have enlarged the sample. This meant that the study did not to include diverse middle income market customers who live in various locations in South Africa, or were not related to the used University.

II. This study intended to have a large sample through the initial university respondents sharing the questionnaire link with their households. However, the snowballing did not occur on the anticipated scale. Thus the sample was smaller than initially intended.

III. As a mixed methods approach was adopted, the combination of several datasets posed challenges synthesising the findings. Despite this, the objective was not to obtain a single version of the truth (Tracy, 2010) but to enrich the understanding of customer adoption in this context.

IV. Securing appropriate subject matter experts to interview was difficult because of the limited number of individuals with deep knowledge and experience of the local South African fintech industry. Fintech research is an emerging academic field in the country, and likewise many of the targeted local industry experts had unique professional backgrounds and accumulated knowledge and practices both in and outside the fintech landscape. Therefore, the study was partially limited to who was qualified enough to respond to the research topic.

3.9 Ethical considerations

Three ethical factors are considered for this study. Firstly, ethical clearance from the University of the Witwatersrand was obtained prior to administering the research instrument to the primary student and faculty population (Appendix E). This clearance allowed the researcher to conduct the research under the guidance of the University's ethics policy, particularly when handling respondent information to ensure that confidentiality was maintained.

Secondly, informed consent was sought from interviewees by providing an accurate account of the study's objectives, and defining the area of research and its anticipated outcomes. Finally, the study assured both sample respondents and interviewees that their participation was voluntary, that their identities would remain anonymous as the information provided would be secure.

CHAPTER 4. RESULTS / FINDINGS PRESENTATION

4.1 Introduction

The objective of this chapter is twofold: to present the quantitative results first as they relate to research question 1. Thereafter, the qualitative findings are presented as they relate to research questions 2, 3 and 4.

Firstly, the quantitative results were the output from the structural equation modelling (SEM) techniques used to test the proposed hypothesised relationships in the modified UTAUT-TAM model (Part 1). Secondly, were the qualitative findings from the barrier instrument (Part 2), and open-ended questions (Part 3). Lastly the qualitative findings from the semi-structured interviews are also presented (Part 4).

4.1.1 *Chapter 4 Outline*

This chapter presents the results and findings in the sequential order of the research questions. A chapter outline is provided below, and provides a breakdown of how each research question was related to an instrument part.

- **Sample characteristics:** describes demographic and sample characteristics.
    a. Part 1 - 3: Descriptive statistics of primary sample of middle income market customers
    b. Part 4: Characteristics of secondary sample of subject matter expert interviewees

- **Research Question 1:**
    a. Part 1: Process and results of measurement scales
        i. EFA for scale reliability and validity
        ii. CFA for convergent and discriminant validity
    b. Part 1: UTAUT-TAM Model Assessment results
        i. Confirmatory Factor Analysis (CFA) for hypothesis testing

ii. Final structural model results presentation

- **Research Question 2:**
    a. Part 2: Barrier instrument frequency findings presentation

- **Research Question 3:**
    a. Part 4: Semi-Structured Interview findings presentation

- **Research Question 4:**
    a. Part 3: Open-ended findings presentation

4.2 Sample Characteristics

4.2.1 *Primary sample (Part 1 – 3)*

The descriptive statistics are presented for the demographic items asked of respondents in the questionnaire. The questionnaire was distributed to the target population of mobile fintech customers in the South African middle income market. Section 3.6.2 discussed the procedure for data screening and management, and how the final sample number of 216 was reached. The descriptive statistics for these participants' demographics are summarised below in Table 4.1, where "Frequency" refers to the number of responses to each question and "Percentage" refers to the percentage or proportion of the total responses.

Table 4.1: Primary Sample Characteristics

Demographic Information

Variable	Description	Frequency	Percentage
Gender	Male	100	46.3
	Female	113	52.3
	Prefer not to say	3	1.4
	Total	**216**	**100%**
Age group	20 years old and younger	1	0.5
	21-35 years old	122	56.5
	36-55 years old	82	38.0
	56 years old and above	11	5.1
	Total	**216**	**100%**
Education	High school or below	6	2.8
	Diploma / Bachelors	75	34.7
	Postgraduate	135	62.5
	Total	**216**	**100%**
Nationality	South African (birth)	182	84.3
	Naturalised South African	6	2.8
	Non-South African	28	13.0
	Total	**216**	**100%**

I. Gender and Age

The sample characteristics in Table 4.1 indicate that females made up the majority of the sample by gender (52.3%), followed by males at 46.3%. A very small proportion (1.4%) of respondents elected not to disclose their gender. What was also evident is that most respondents (56.5%) were in the 21–35 age group, followed by the 36–55 age group at 38%. The least represented age groups were the 56 and above range at 5.1%, and the 20 years and younger group at 0.5%.

II. Education

Regarding the sample's education levels, the majority of the sample (62,5%) held a postgraduate qualification. Secondly, 34.7% had reached undergraduate level while a small minority of 2.8% had only completed high school education.

III. Nationality

The overwhelming majority of the sample were South African by nationality, either by birth (84.3%) or naturalisation (2.8%). A small percentage of 13% were non-South African respondents and were included in this study because currently they were residing in this country.

IV. Middle Income Market Position – individual and household

Table 4.2: Characteristics of Middle Income Market Sample

Variable	Description	Frequency	Percentage
Individual Middle income position	R1 400 - R 3 656	19	8.8
	R3 656-R9 999	22	10.2
	R10 000 – R25 000	72	33.3
	R25 000 and more	103	47.7
	Total	**216**	**100%**
Household Middle income position	R3 656 and less	9	4.2
	R3 656- R9 999	27	12.5
	R10 000 - R24 999	57	26.4
	R25 000 and more	123	56.9
	Total	216	**100%**
No. of Household Dependents	1 - 3	129	59.7
	4 - 6	76	35.2
	7 and more	11	5.1
	Total	**216**	**100%**

V. Individual middle income market position

The results showed that almost half of the sample (47.7%) earned a monthly net income of R25 000 per month and more, representing the majority of this study's middle income market sample. This leading group was closely followed by individuals who earned between R 10 000 – R 25 000 (33.2%). The two other smaller income ranges were positioned between R 3 656 – R 9 999 (10.2%) and R1 400 - R 3 656 (8.8%).

VI. Household middle income market position

The largest proportion (56.9%) of this sample of middle income households earned an accumulated income of R25 000 per month and above. Moreover, some of the accumulated group of respondents (52.3%) who individually earned below the R25 000 mark now belonged to the higher household income range of R25 000 and above. This caused a 9.2% growth (from 47.7% to 56.9%) growth in the majority household earnings of R 25 000 and above.

There was a second group of households making up a quarter of the sample (26.4%) who collectively earned between R10 000 and R24 999 net income per month. The last two groups in this sample were in households that earned up to R9 999 (12.5%) or less than R3 656 (4.2%).

VII. Number of dependents in the household

The number of dependents in a household provided additional information into the monthly distribution of net income. Results showed that the average middle income market household in this sample (59.7%) had between one and three individuals depending on their income. This indicates that more than half the respondents had relatively small households. A noticeable second group of respondents (35.2%) had between four and six dependents living off their monthly household income. A third group and smallest percentage of respondents follow (5.1%) and had seven or more dependents living off their monthly household income.

VIII. **Digital Profile – Internet usage and digital segment**

Table 4.3: Digital Profile Sample Characteristics

Variable	Description	Frequency	Percentage
Digital profile: Internet usage	1 hour and less	7	3.2
	1 - 2 hours	12	5.6
	2 to 3 hours	197	91.2
	Total	**216**	**100%**
Digital Profile: Segment	Digital Aliens	10	4.6
	Digital Laggards	28	13.0
	Digital Natives	46	21.3
	Digital Immigrants	132	61.1
	Total	**216**	**100%**

In terms of the digital profile variable, respondents were asked to answer two questions. The first related to their daily internet usage, and the second to their digital profile segment. As Table 4.3 indicates, the majority of respondents (91.2%) exhibited a high daily internet usage of two to three hours. A small proportion of 5.6% selected one to two hours of daily internet usage, followed by 3.2% who used the internet for less than one hour per day.

In the case of digital profile segments, the four designations related to digital consumer generations (Kaufman, 2011) to which respondents believed they belonged. The two leading digital identities of Digital Immigrants (61.1%) and Digital Natives (21.3%) demonstrated high digital integration in the behaviour and personhood (Belk, 2013) of respondents, and also accounted for the majority of this middle income sample with a combined percentage of 82.4%. In comparison, there were smaller groups of respondents who were identified as Digital Laggards (13%) and Digital Aliens (4.6%) as they selected behaviours typical to these digital profiles.

4.2.2 *Secondary sample (Part 4)*

As per Table 4.4 below, the researcher conducted four semi-structured interviews with top-level fintech executives in South Africa for the qualitative interview component of the study. The summary in the table reflects the interview qualifiers, such as participant education level and fintech experience which the researcher

used to select participants, and to demonstrate the professional calibre and research credibility of this sample. In addition, each interview ranged from 30 to 50 minutes in duration to ensure that participants were given the opportunity to delve more deeply into the questions. The researcher used an interview protocol and guide (Appendix H) to direct the interviews, and the transcripts concealed personal participant information by the use of codes to ensure anonymity.

Table 4.4: Interview Sample Characteristics

Participant Code	Education	Position	Industry	Fintech Experience	Duration (min)
A1	Master of Philosophy	Chief Marketing Officer	Insurance Technology	5 years	47
A2	Bachelor of Engineering	Chief Product Officer	Crypto-currency	3 years	34
A3	Master of Science	Head of Fintech	Fintech Regulation	2 years	52
A4	Master of Commerce	Head of Digital	Research Consulting	6 years	47
Total interview minutes					**180**

Each participant was selected because of their professional expertise, education and personal experience in the current South African fintech landscape. All interviews were conducted and recorded online, either on Zoom or Microsoft Teams. The first group of two participants (A1 – A2) worked in South African fintech companies, and thus provided the study with supply-side insights (internal perspective). The first participant was a marketing executive for an insurtech (insurance technology) company, and the second one was a founder and chief product officer of a leading crypto-exchange company in South Africa. In contrast, the second group of two participants held advisory and consulting positions as they worked alongside local fintech companies (participant A3) or conducted research for the local fintech industry and government (participant A4). As a result, their particular input provided this study with an external perspective informed by customer demand-side insights into the South African middle income market.

4.3 Results for Research Question 1

RQ1: What are the middle income market's adoption barriers and facilitators of mobile fintech?

4.3.1 *Part 1: SEM Procedures*

Structural Equation Modelling (SEM) was performed to measure and assess the proposed UTAUT-TAM model (Figure 3.2). Field (2009) advises for studies such as this one to satisfy multivariate statistical assumptions in order to achieve a reliable model. This would ensure that the measurement and structural model results are generalisable to the population of interest. In keeping with SEM procedures, this study's UTAUT-TAM model used exploratory factor analysis techniques (EFA) to test the proposed relationships. Then confirmatory factor analysis (CFA) was performed to determine the significance of the proposed hypothesis relationships (Hair et al., 1998).

This part of the research instrument sought to answer research question 1 by examining the independent variable facilitators (positive predictors) and the barriers (negative predictors) that influence the dependent variables of behavioural intention (BI) and behavioural use (USE) of mobile fintech in the middle income market. The positive predictors were effort expectancy (EE), hedonic performance expectancy (HPE), utilitarian performance expectancy (UPE), self-efficacy (SELF) and social influence (SI). The proposed negative predictors were facilitating conditions (FC), trust (TRUST), security (SEC), risk (RISK) and attitude (ATT).

The primary sample data from Qualtrics was first cleaned and prepared for measurement scale procedures, in order to proceed to the factor analyses stages (EFA and CFA).

I. *Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy*

As part of a validity measure to assess the factors, the sampling adequacy of the scales were examined by assessing the Kaiser-Meyer-Olkin (KMO) and the Bartlett's test of sphericity. These two measures ensured that the data was suitable for factor analysis (Alshehri, 2012). The KMO measures of sampling adequacy were above the required minimum value of 0.6 for all 12 constructs. Bartlett's test of sphericity was also highly statistically significant (p-value<0.000), indicating consistency with cut-off values and suggesting that factor analysis was appropriate.

Table 4.5: KMO Measure of Sampling Adequacy

#	Construct	KMO & Bartlett's Test
1.	EE	0.764
2.	HPE	0.723
3.	TR	0.585
4.	SEC	0.532
5.	SI	0.640
6.	FC	0.662
7.	UPE	0.635
8.	SELF	0.613
9.	ATT	0.746
10.	RI	0.803
11.	BI	0.762
12.	USE	0.758

II. *Univariate Normality*

The model constructs were tested for univariate normality as a pre-analysis and data screening measure (Hair et al., 1998). Univariate normality statistically checks the data distribution for each construct. As a result, the skewness and kurtosis statistics were produced for each of the constructs and provided in Appendix I.i. The results demonstrated that each value and construct were within the acceptable range of skewness and kurtosis of – 2.58 and +2.58.

III. *Reliability: Internal Consistency*

The reliability of results from the Likert scales in the UTAUT-TAM items were measured using Cronbach's alpha on each of the constructs. Cronbach alpha scores above 0.7, indicate adequate internal consistency and therefore the acceptable reliability of a model's measurement model.

The Cronbach's Alpha for each of the constructs in this study exceeded 0.70 (Figure 4.6) indicating a high level of internal consistency and reliability. Internal consistency is the measure of every scale producing consistent outcomes for each construct (Kline, 2005). The cut-off value of 0.6 was adopted for this study as the lower limit and benchmark value (Hair et al., 1998).

Table 4.6: Cronbach Alpha Analysis

#	Construct	Cronbach's alpha
1.	EE	0.95
2.	HPE	0.91
3.	TR	0.73
4.	SEC	0.79
5.	SI	0.80
6.	FC	0.81
7.	UPE	0.82
8.	SELF	0.78
9.	AT	0.89
10.	RI	0.83
11.	BI	0.92
12.	BU	0.94

IV. *EFA for reliability and validity*

Explanatory Factor Analysis (EFA) was performed on the collected data, as a preliminary measure to ensure construct reliability and uni-dimensionality. The 12 factors were realised from the EFA, based on 216 cases from this study's primary sample.

All 12 factors that remained had three indicator variables, except for the 1 Risk item (Risk5) which was deleted from the EFA due to negatively relating to all the other Risk items (Table 4.7). Thereafter, the rest of the Risk items were positively statistically significant with the other items.

Another noticeable EFA result was that the factor loadings of the Security (SEC) factor items were all higher than 0.6 except one item (highlighted in Table 4.7). Nonetheless, all the SEC items were able to measure the security construct.

Overall, the factor loadings for all items in the models' constructs were higher than 0.6, except for one item under security (Table 4.7). In addition, the corrected item-total correlation for all items was greater than the cut-off value of 0.3, suggesting that the items were good measures of the model constructs.

Table 4.7: EFA Factor Loadings

Items	Factor loading	Corrected item–total correlation
Effort Expectancy		
EE1	0.941	0.869
EE2	0.961	0.911
EE3	0.949	0.885
Hedonic Performance Expectancy		
HPE1	0.895	0.771
HPE2	0.947	0.873
HPE3	0.915	0.808
Trust		
Trust1	0.798	0.468
Trust2	0.671	0.386
Trust3	0.876	0.607
Security		
Security1	0.860	0.551
Security2	0.897	0.631
Security3	0.489	0.240
Social Influence		
Social	0.831	0.611
Social	0.795	0.574
Social	0.912	0.760
Use Behaviour		
Use	0.932	0.851
Use	0.960	0.909
Use	0.952	0.891
Behavioural Intention		
Behavioural	0.930	0.841
Behavioural	0.929	0.840
Behavioural	0.944	0.870

Items	Factor loading	Corrected item–total correlation
Facilitating Conditions		
FC1	0.874	0.688
FC2	0.906	0.742
FC3	0.775	0.556
Utilitarian Performance Expectancy		
UPE1	0.883	0.696
UPE2	0.926	0.793
UPE3	0.765	0.545
Self-Efficacy		
Self efficacy1	0.677	0.433
Self efficacy2	0.904	0.723
Self efficacy3	0.906	0.728
Attitude		
Attitude1	0.896	0.769
Attitude2	0.916	0.807
Attitude3	0.925	0.826
Risk		
Risk1	0.825	0.690
Risk2	0.820	0.682
Risk3	0.804	0.668
Risk4	0.761	0.624
Risk6	0.666	0.514

4.3.2 *Part 1: Structural Model Assessments*

I. *CFA assessments for convergent and discriminant validity*

This section examines the confirmatory factor analysis (CFA) model designed to test the theoretical constructs. The objective of CFA is to assess the construct validity of the proposed measurement model (Hair et al., 1998). The performed EFA proved the proposed model to be reliable and demonstrated uni-dimensionality. However, EFA does not provide a complete assessment of the construct validity and uni-dimensionality. It was therefore necessary to perform confirmatory factor analysis (CFA) to test the theoretical constructs of this study's measurement model, and to also examine the extent to which this model fits the data collected. This involved an assessment of both the convergent validity and the discriminant validity. The CFA procedures were performed on R software version 4.0.2.

II. *CFA: Goodness of fit (GOF)*

Ten model-fit measures were used to assess the overall goodness of fit of the proposed model in order to reproduce the data prior to hypothesis testing. The measurement model exhibited a good fit with the data as the fit indices exceeded their respective suggested levels (Table 4.8). It can be concluded from the fit indices that construct validity was achieved since the indices reflected the recommended values. Moreover, the CFA on the latent factors produced satisfactory overall fit indices.

Table 4.8: CFA: Measurement Model Assessment Criteria and Outcome

Fit Indices	Recommended Range	Result
χ2/df (chi-square to degrees-of-freedom	> 3	1.86
RMSEA (root mean square error of approximation	< 0.06	0.06
SRMR (standardized root mean square residual)	< 0.08	0.05
CFI (comparative fit index)	> 0.95	0.93
TLI (Tucker-Lewis Index)	> 0.95	0.91
GFI (goodness-of-fit)	n/a	0.82
NFI (normalized fit index)	> 0.95	0.86
NNF I (non-normalised fit index)	> 0.95	0.91
RFI (relative fit index)	> 0.95	0.83

III. *CFA: Construct Validity: Discriminant Validity*

Discriminant validity is the ability of the variables to reflect their constructs differently from other variables in the model. This is usually tested by comparing the square roots of the average variance extracted (AVE) to the inter-construct correlation. Fornell and Larcker (1981) argue that the square root of the AVE should be greater than the inter construct correlations to satisfy the condition of discriminant validity.

In this study, discriminant validity was assessed by comparing the absolute value of the inter-construct correlations to the square root of the average variance extracted by a construct. When the correlations are lower than the square root of the average variance extracted by a construct, constructs are said to have discriminant validity (Fornell & Larcker, 1981). As shown in Table 4.9, all square roots of the AVE (diagonal cells) were higher than the correlations between constructs and this confirmed adequate discriminant validity.

Table 4.9: Correlations and Discriminant Validity for Measurement Model

Constructs	1	2	3	4	5	6	7	8	9	10	11	12
1. EE	**0.93**											
2. FC	0.82	**0.79**										
3. HPE	0.62	0.56	**0.88**									
4. UPE	0.70	0.71	0.74	**0.80**								
5. TR	0.37	0.31	0.48	0.53	**0.77**							
6. SELF	-0.15	-0.10	-0.06	-0.09	-0.04	**0.77**						
7. SEC	0.39	0.36	0.46	0.50	0.65	-0.09	**0.81**					
8. RIS	-0.21	-0.19	-0.21	-0.21	-0.25	0.15	-0.31	**0.80**				
9. ATT	0.50	0.44	0.45	0.53	0.43	-0.21	0.43	-0.20	**0.87**			
10. SI	0.11	0.14	0.12	0.23	0.20	0.20	0.26	-0.13	0.19	**0.78**		
11. BI	0.40	0.36	0.34	0.45	0.42	-0.23	0.41	-0.08	0.64	0.15	**0.90**	
12. USE	0.46	0.49	0.35	0.49	0.30	-0.29	0.22	-0.03	0.46	0.14	0.60	**0.94**

IV. *CFA: Construct Validity: Convergent Validity*

Convergent validity is the association between two different measurement scales measuring the same concept. In CFA, the convergent validity depends on the average variance extracted. A high AVE indicates a high reliability and convergent validity of the dimension. The AVE should generally be above 0.5.

Composite reliability and AVE are used to measure the convergent validity of the measurement constructs. When the composite reliability exceeds 0.7, the constructs are deemed to have convergent validity. Table 4.10 shows the composite reliability and average variance extracted for the constructs in the model. The composite reliability of the constructs exceeded 0.7, indicating that there was no overlap between the measures. The AVE for all the constructs exceeded the recommended limit of 0.5. The results supported the model's adequate convergent validity.

Table 4.10: Measurement Model Results

Constructs/ Factors	Factor Loading	Composite Reliability	AVE
Effort Expectancy		0.95	0.86
EE1	0.913		
EE2	0.946		
EE3	0.918		
Facilitating Conditions		0.83	0.62
FC1	0.814		
FC2	0.887		
FC3	0.635		
Hedonic		0.91	0.77
HPE1	0.818		
HPE2	0.961		
HPE3	0.851		
Utilitarian		0.84	0.64
UPE1	0.892		
UPE2	0.880		
UPE3	0.585		
Trust		0.74	0.59
Trust1	0.800		
Trust3	0.729		
Self-Efficacy		0.81	0.60
SELF1	0.466		
SELF2	0.915		
SELF3	0.860		
Security		0.80	0.66
SECURITY1	0.812		
SECURITY2	0.816		
Risk		0.84	0.64
RISK1	0.856		
RISK2	0.832		
RISK3	0.697		
Attitude		0.90	0.75
ATT1	0.827		
ATT2	0.888		
ATT3	0.881		
Social		0.82	0.61
SI1	0.704		
SI2	0.635		
SI3	0.963		
Intention		0.93	0.81
BI1	0.897		
BI2	0.879		
BI3	0.917		
Use		0.96	0.89
USE1	0.935		
USE2	0.894		
USE3	0.999		

4.3.3 *Part 1: CFA Assessment Results*

I. *CFA for hypothesis testing*

After successfully completing the assessment of the measurement model, the relationship between the constructs was tested. This is done through the structural model in order to test the hypotheses relationships.

The procedure for the assessment of the structural model included an inspection of model fit indices and the standardized path coefficients (Table 4.11) to examine which hypothesised relationships were supported and which were not. For any hypothesised relationships to be supported, the standardised path coefficients between constructs must be statistically significant at the 0.05 level, and greater than 0.30 to be considered meaningful (Byrne, 2001). The fit indices for the structural model are presented in Table 4.11 while the final structural model is depicted in Figure 4.1.

Table 4.11: Structural Model Results: Standardized path coefficients

	Path (Hypothesis)	Standardised path coefficient	t-value	Hypothesis testing result
1	**EE→BI**	0.135	0.538*	Not supported
2	**FC→BI**	-0.289	-0.534*	Not supported
3	**HPE→BI**	-0.168	-0.954*	Not supported
4	**UPE→BI**	0.414	0.775*	Not supported
5	**TR→BI**	0.260	0.874*	Not supported
6	**SELF→BI**	-0.131	**-1.767****	Supported
7	**SEC→BI**	-0.166	-0.906*	Not supported
8	**RISK→BI**	0.108	1.499*	Not supported
9	**ATT→BI**	0.550	**3.382****	Supported
10	**SI→BI**	0.032	0.542*	Not supported
11	**BI→USE**	0.632	**6.253****	Supported

***Model fit indices*: $\chi 2$** = 971, *df* = 498, *x2/d.f.* = 21.95, *AGFI* = 0.761, *GFI* = 0.811, *NFI* = 0.848, *NNFI* = 0.903, *CFI* = 0.918, *RFI* = 0.819, *TLI* = 0.903, *RMSEA* = 0.06, *SRMR* = 0.07

** indicates: p-value is < 0.001,
* indicates: Not significant

According to the results in Table 4.11; two of the 11 path coefficients (hypotheses) were statistically significant at 5%, with one at 10%. The supported hypothesised relationship results revealed the following:

- Self-Efficacy (SELF) negatively predicted behavioural intention at 10% but not at 5% (-0.131, p-value=0.077). This construct is thus the only negative predictor for this study as evidenced by the negative standardized coefficient (-0.131), but it simultaneously has a significant p-value. Therefore, SELF is the only barrier relationship to BI and thus **H6** is supported (at 10%).
- The Attitude (ATT) construct positively predicted behavioural intention construct (0.550, p-value=0.001) supporting **H9**.
- Behavioural Intention (BI) positively predicted use behaviour (0.632, < 0.001) supporting **H11**.

In summary, the standardized path coefficients between ATT-BI and SELF-BI were highly significant. In addition, the standardized coefficient between BI and USE was extremely significant. The results also showed that the ATT construct had a strong and positive influence on the BI construct. And lastly, the BI construct had a strong and positive influence on USE.

II. *Structural Model Presentation*

The analysis proved that the combined structural model (Figure 4.1) is able to predict 60.5% of the variance in BI and 28.8% in CU. Furthermore, Table 4.12 shows the accepted and rejected hypothesised relationships.

Detailed CFA results confirmed that 2 independent variables (ATT, BI) are significant predictors for BI. BI predicts the usage (USE) and thus customer adoption of mobile fintech. Most notably, ATT is the strongest predictor and facilitator of BI. In addition, SELF emerged as a significant variable yet with a negative relationship to BI and thus becomes a barrier to the customer adoption of mobile fintech for this sample.

Figure 4.1: Final Structural Model Presentation

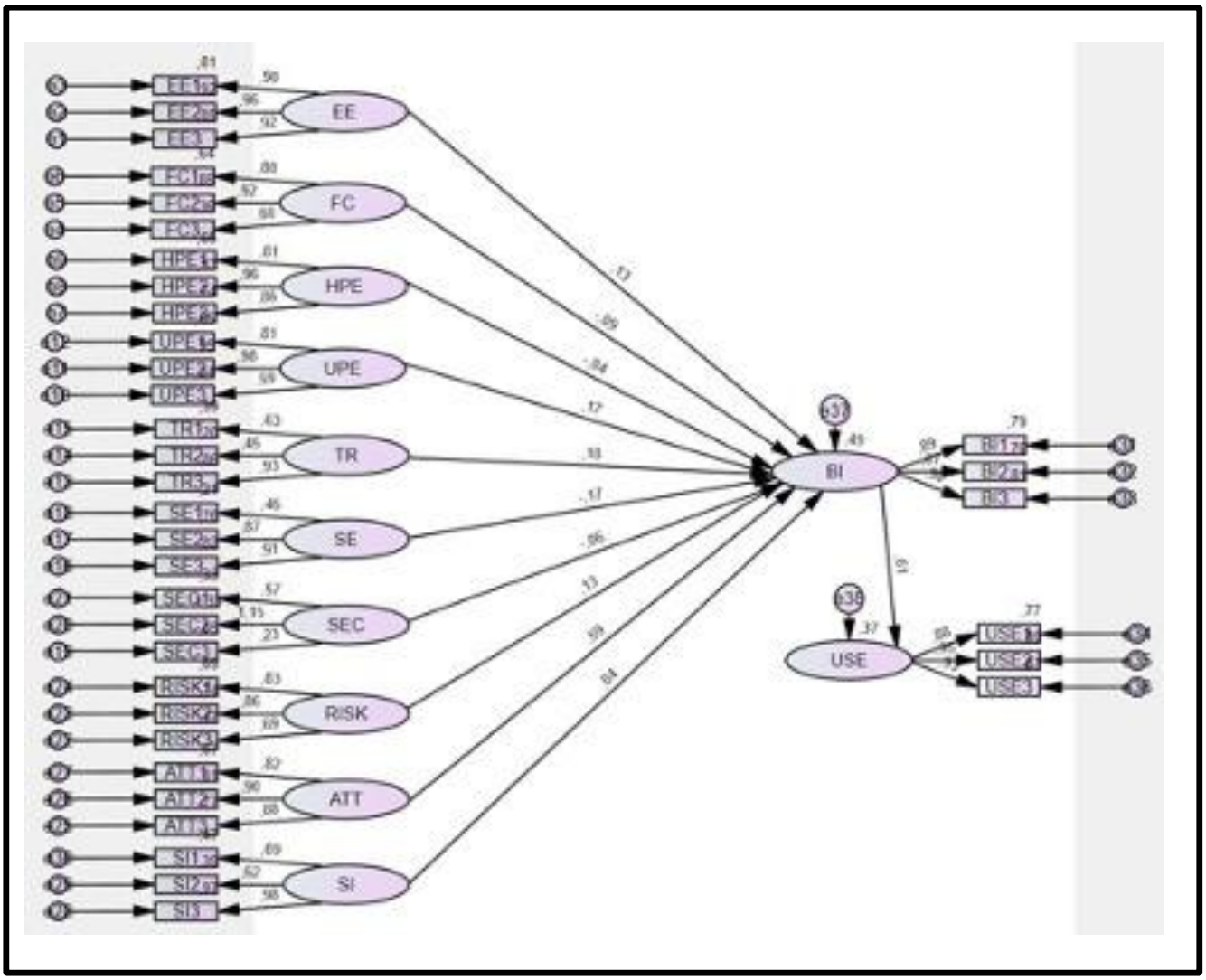


Table 4.12: Summary of UTAUT-TAM hypothesis results

H #	Description	Result
H1	Effort Expectancy (EE) will have a positive influence on behavioural intention (BI) to use mobile fintech	Rejected as a Facilitator
H2	Facilitation Conditions (FC) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech	Rejected as a Barrier
H3	Hedonic Performance Expectancy (HPE) will have a positive influence on behavioural intention (BI) to use mobile fintech	Rejected as a Facilitator
H4	Utilitarian Performance Expectancy (UPE) will have a positive influence on behavioural intention (BI) to use mobile fintech	Rejected as a Facilitator
H5	Trust (TR) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech	Rejected as a Barrier
H6	Self-Efficacy (SELF) will have a positive influence on behavioural intention (BI) to use mobile fintech	**Accepted as Barrier** Rejected as a Facilitator
H7	Security (SEC) will a significant but have a negative barrier relationship on behavioural intention (BI) to use mobile fintech	Rejected as a Barrier
H8	Risk (RI) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech	Rejected as a Barrier
H9	Attitude (ATT) will have a significant but negative barrier relationship on behavioural intention (BI) to use mobile fintech	**Accepted as Facilitator** Rejected as a Barrier
H10	Social Influence (SI) will have a positive influence on behavioural intention (BI) to use mobile fintech	Rejected as a Facilitator
H11	Behavioural Intention (BI) will have a positive influence on the usage (USE) of mobile fintech	**Accepted as Facilitator**

III. *The Effect of Moderators*

This section discusses the effect of moderators on the relationship between the independent variables and dependent variable. This relationship was expected to change as a result of the moderator. The moderator would make the relationship between the dependent and independent variables weaker or stronger. The moderators used in this study included age (AGE), digital profile (DIGIP) and middle income market (MIM).

i. *Middle Income Market Impact*

The MIM moderator was calculated by summing the individual monthly income and household accumulated monthly income after tax deductions. The analysis of whether the influence of facilitating conditions (FC), utilitarian performance expectation (UPE) and trust (TR) on behaviour intention (BI) is moderated by MIM was performed by testing three moderating hypothesis relationships i.e., H2a, H4a and H5a. The results of the moderations are shown in Table 4.13.

Table 4.13: Moderator Analysis for Middle Income Market

No.	Variable	Estimate	t-value	p-value
	Middle Income Market (MIM)	0.261	2.736	0.006
H2a	FC and BI	-0.154	-0.640	0.520
H4a	UPE and BI	-0.170	-0.730	0.465
H5a	TR and BI	0.013	0.057	0.955

The results indicated that middle income (MIM) had a positive estimate value at 0.261, and a significant impact with a t-value of more than 1.956 on behavioural intention (BI).

However, there is no moderation effect of MIM onto FC-BI (Hypothesis 2a relationship) because the p-value is above 0.05. meaning that when MIM is interrelated with FC-BI then this relationship is not significant. In addition, there was no moderation effect of MIM onto UPE-BI (Hypothesis 4a relationship) as the p-value is more than 0.05. Lastly, the interaction of MIM onto TR-BI (Hypothesis 5a relationship) did not have any moderation effect with the p-value of more than 0.05.

ii. *Digital Profile impact*

The digital profile variable was created by adding internet usage per day and the statement respondents selected as the best way to describe their digital segment identity. The analysis of whether the influence of utilitarian performance expectation (UPE) on behaviour intention (BI) moderated by digital profile (DIGIP) was performed by testing the Hypothesis 4b relationship.

Table 4.14: Moderator analysis for digital behaviour

No.	Variable	Estimate	t- value	p-value
	Digital Profile (DIGIP)	2.962	3.355	0.001
H4b	UPE and BI	-1.083	-2.581	**0.010**

The results showed that DIGIP had a direct significant impact on BI with an estimate value of 2.962. However, it was found that UPE did not have a direct significant impact on BI. Despite this, when the H4b relationship (UPE-BI) was moderated by DIGIP, there was a moderation effect at an evidently significant p-value of more than 0.05.

iii. *Age impact*

Table 4.15: Moderator Analysis for Age

No.	Variable	Estimate	t-value	p-value
	Younger sample			
H4c	UPE and BI	0.851	0.973	0.331
	Older sample			
H4c	UPE and BI	-5.241	-0.119	0.905

The sample descriptives for the age (AGE) variable was divided into two groups: a younger sample and an older sample. Respondents who were 35 years and younger were categorized into the younger sample of respondents. Respondents who were 36 years and older were categorised in the older sample of respondents.

The analysis of whether the influence of UPE on behaviour intention (BI) was significantly moderated by AGE, was performed by testing the Hypothesis 4c relationship. Results showed in insignificant values with p-values, for both age categories, were above 0.05. Therefore, the relationship between UPE and BI did not vary across the two age groups.

The results of the five hypothesis relationships are summarised below (Table 4.16). The H4b hypothesis relationship emerged as the only accepted moderation relationship and will be discussed in Chapter 5.

Table 4.16: Moderation Hypotheses Results

	Moderator Descriptions	
H2a	FC – BI to use mobile fintech is moderated by middle income market customers	Rejected
H4a	UPE - BI to use mobile fintech is moderated by middle income market customers	Rejected
H5a	TR – BI to use mobile fintech is moderated by middle income market customers	Rejected
H4b	UPE - BI to use mobile fintech is stronger for users with highly digital behavioural activity and digital history, than users with low digital behavioural activity and digital history.	**Accepted**
H4c	UPE - BI to use mobile fintech is stronger for younger users than older users	Rejected

4.3.4 *Summary of Part 1 results (UTAUT-TAM)*

The results for quantitative component of this study (research instrument part 1) were presented without interpretation. This component obtained a sample size of 216 respondents. A complete description of the sample was provided indicating a majority of highly educated and predominantly young group of South Africans who regularly use the internet every day. This sample is also characterised as belonging to small households with accumulated net income of R 25 000 and more per month.

Structural equation modelling (SEM) was conducted on the proposed UTAUT-TAM theoretical model. Two SEM techniques were used i.e. EFA and CFA. Firstly a measurement model was produced via EFA procedures that tested and resulted in reliable and valid outcomes for the 12 x proposed constructs and each scale. Secondly, CFA was performed to produce the structural model that demonstrated the significant and non-significant hypothesised relationships. These results are the basis for the discussion that follows in Chapter 5 for research question 1, as well as the mixed discussion for research question 2.

4.4 Findings for Research Question 2

RQ2: How do the qualitative findings further explain the customer adoption barriers of mobile fintech in the middle income market?

4.4.1 *Part 2: Barrier instrument findings*

This study designed for RQ2 to be answered through a mixed discussion between instrument part 2 barrier findings, and instrument part 1 results. The barrier findings were a useful tool to compare with the UTAUT-TAM items (Part 1) as it provided specific qualitative explanations on the reasons for customers' possible reluctance to adopt mobile fintech. Therefore, the objective of the below section was to present the findings for the qualitative barriers that customers themselves regarded as a priority in comparison to the barriers that were not sufficiently important.

The barrier items in part 2 of the research instrument formed part of the questionnaire completed by respondents. The respondents answered according to the degree to which they perceived a barrier statement was 'not a barrier', an 'important barrier' or a 'very important barrier'. The barriers regarded by respondents as very important and important are deemed to be priority issues that mobile fintech, banks and government players, who target and serve this market, should prioritise.

I. *Findings for customer perceptions on adoption barriers: Ranking and percentages*

Each barrier was ranked according to the mean scores on the Likert scale (Table 4.17). As a result, the top five barriers (BA7, BA4, BA2, BA9, BA1) all obtained a mean score above 2, indicating that customers perceived these barriers as 'very important barriers' to their adoption of mobile fintech.

The percentage distribution of levels of importance for middle income customers is also provided (Table 4.17). Major findings included a lack of privacy (at 42.6%) and a lack of internet or smart phones (at 44.4%) as the two 'very important' barriers facing middle income customers. A second major finding was that the

two least significant barriers to customer adoption, and perceived as ‘not a barrier’ were the lack of fun or entertainment factor (at 61.1%) and a lack of willingness to learn how to use mobile fintech applications (at 42.2%).

Table 4.17: Results of Barrier Instrument

Rank	Barrier Statements	Not a Barrier	Important Barrier	Very Important Barrier	Mean
		Percent	Percent	Percent	Score
1	**BA7:** Lack of privacy of personal information on mobile fintech applications	18.1	39.4	42.6	2.25
2	**BA4:** Lack of internet connection and/or smart phones to use mobile fintech applications.	30.6	25.0	44.4	2.14
3	**BA2:** Lack of user knowledge about mobile fintech applications.	29.2	32.9	38.0	2.09
4	**BA9:** Lack of security assurances (a pop-up screen with T&C's) to advise the security controls used on the mobile fintech application.	23.1	45.8	31.0	2.08
5	**BA1:** Lack of user digital literacy to navigate and interact on mobile fintech applications.	33.8	32.4	33.8	2.00
6	**BA8:** Lack of technical support (e.g. robo-advisors / chatbots) on mobile fintech applications.	28.2	46.8	25.0	1.97
7	**BA5:** Lack of national policy and regulation for the use of mobile fintech applications in South Africa.	32.4	40.3	27.3	1.95
8	**BA6:** Lack of partnership and collaboration between mobile fintech services and traditional banks in South Africa	35.6	35.6	28.7	1.93
9	**BA10:** Lack of online peer reviews for mobile fintech applications.	33.3	42.1	24.5	1.91

10	**BA11:** Lack of positive customer sentiments towards using mobile fintech applications.	35.2	40.3	24.5	1.89
11	**BA12:** Lack of useful benefits in using mobile fintech applications.	35.6	42.6	21.8	1.86
12	**BA3:** Lack of different user language options (e.g. vernacular) available on mobile fintech applications.	41.2	31.9	26.9	1.86
13	**BA14:** Lack of willingness to learn how to use mobile fintech applications.	42.1	38.9	19.0	1.77
14	**BA3:** Lack of fun or entertainment factor to using mobile fintech applications.	61.1	25.5	13.4	1.52

4.5 Findings for Research Question 3

RQ3: What are the emergent factors that contribute to the customer adoption of mobile fintech in the middle income market?

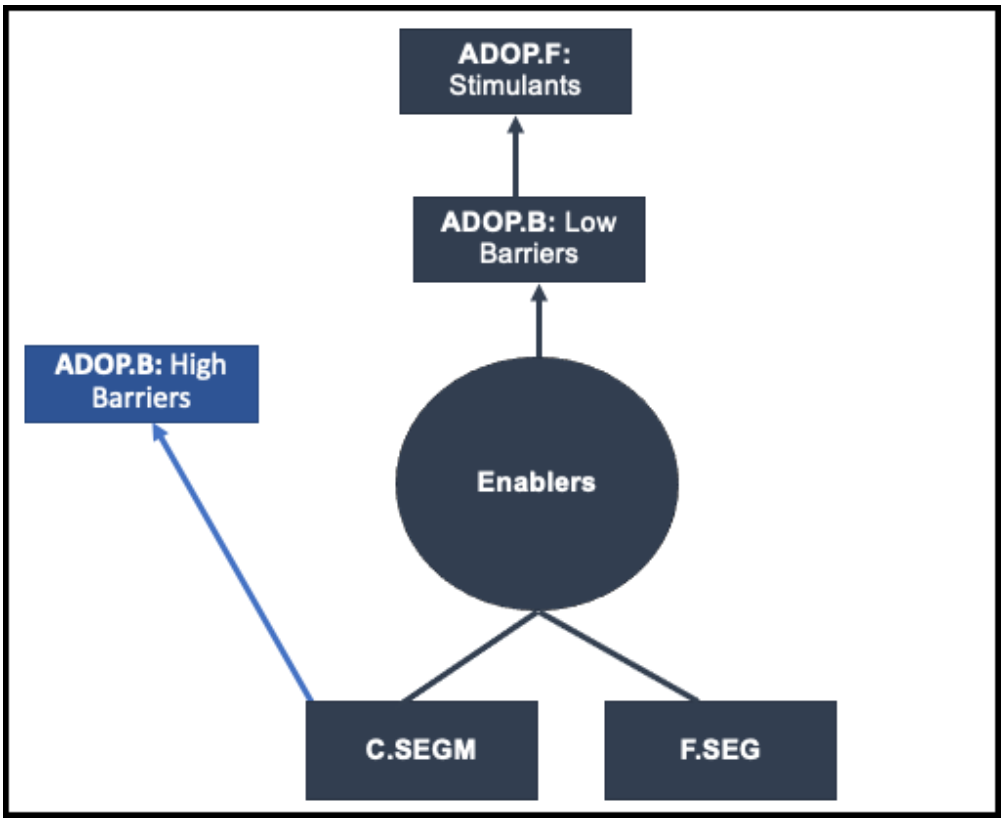
4.5.1 *Part 4: Interview findings*

This section presents the thematic analysis (TA) outcomes from the semi-structured interviews which answered the third research question. This research question fell under the research objective 1, which was to explore the barriers and facilitators for customer adoption of mobile fintech in the middle income market. It allowed the researcher to address the objective by asking open questions in the semi-structured interviews.

4.5.2 *Code Development*

There were two sets of interviewees; two interviewees provided insights from working in fintech and two interviewees provided information from working outside fintech. Both these perspectives were coded according to labels indicating whether a factor was firstly an adoption barrier or facilitator, and secondly how this factor influenced customer adoption (Coding System). A coding tree was created under overarching labels that assisted the researcher to avoid over coding (Guest et al., 2012). The coding tree (Figure 4.2) demonstrates the inter-connectedness of the codes as a preparatory step for category and eventually theme development.

Figure 4.2: Coding Tree



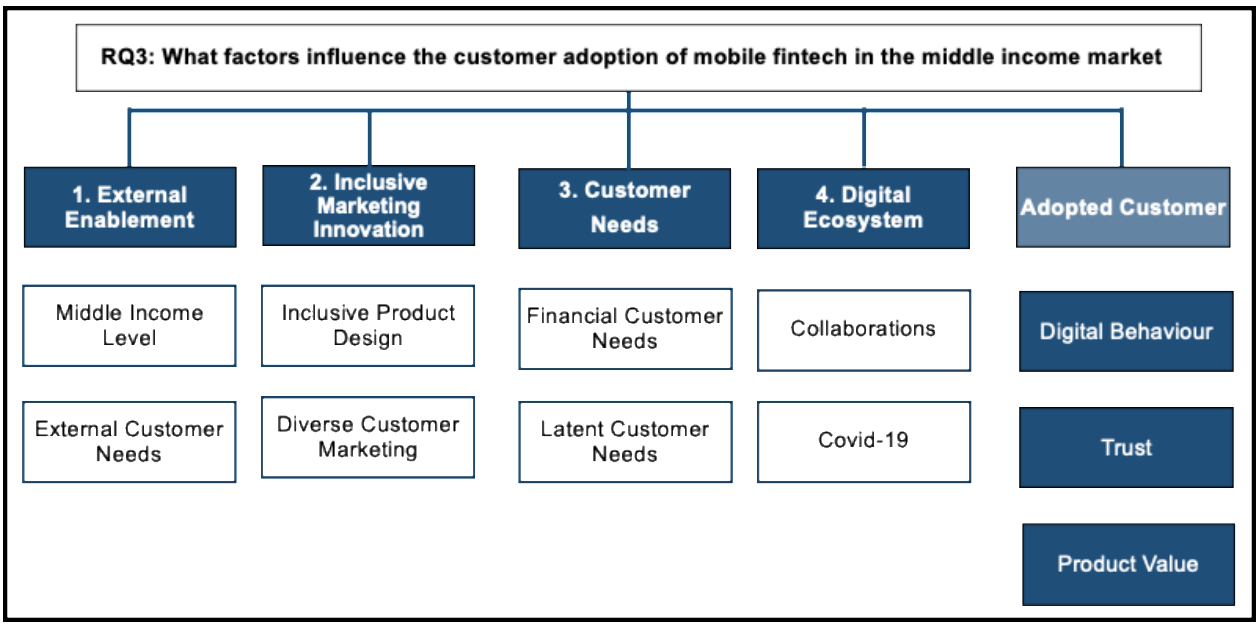
The coding tree assisted the researcher in creating a network of codes, specifically for defining which barriers were high and which were low. In other words, barriers that customers could overcome and enabled adoption of mobile fintech were low, and others were considered high barriers to overcome. As depicted in the coding tree and its development table (Appendix J.v) the findings showed that the high barriers were characteristics which often emanated from customers themselves (highlighted in Figure 4.2).

An example of the high barriers were customer segment characteristics such as high cash use, lack of financial literacy and low trust, which were also repeated codes. After the coding tree development, all the codes were then grouped into 21 and 19 categories (see Appendix J.i and Appendix J.ii) that were from responses from inside and outside the mobile fintech interviews. Thereafter, overarching themes and sub-themes were developed.

4.5.3 *Theme Development*

The four themes that were derived from the interview findings as emergent factors that influence customer adoption of mobile fintech were External Enablement, Inclusive Marketing Innovation, Customer Needs, Digital Ecosystem. The three sub-themes of Trust, Product Value and Digital Behaviour were indicator constructs for customers who had fully adopted mobile fintech in the middle income market. Figure 4.3 below is a mind map presentation of the themes and sub-themes.

Figure 4.3: Emergent factors of customer adoption



i. ***Theme 1: External Enablement***

External Enablement factors outside customers' control or current capability emerged as a clear theme that all interviewees mentioned as affecting the customer adoption of mobile fintech. These included socio-economic factors such as owning a smart phone, financial literacy, education, data, network coverage within an urban area and most importantly, the impact of the customer's income level or finances and ability to access mobile fintech applications. External enablement also included perceived customer needs that were appearance driven and thus external, spurring customers on to overcome barriers and adopt mobile fintech.

It has been suggested that external enablement is firstly catalysed by a customer's level of income. In this study, respondents' income level was best exemplified by the type of smart phone they owned; did it have the appropriate hardware and software capabilities for mobile fintech? Should customer income levels not meet the requirements for mobile fintech use, income became a barrier, as described by Participant A2:

> *"I think the biggest impediment is access to a device that supports it [mobile fintech application], and access to data. And I think that is the challenge that South Africa faces" (Participant A2).*

Participant A3 corroborates this by stating that smart phones act as an access point and thus a potential barrier to adoption for the middle income market:

> *"Smart phone penetration, that is also a barrier. So typically, smart phones are actually the gateway - being able to interact digitally. So, data penetration, smart phone penetration, income – those are things" (Participant A3).*

Therefore, possessing an appropriate smart phone is affected by a customer's income level. Moreover, throughout the interviews several participants repeatedly made a distinction between lower-end middle income and upper-end middle income customers. This distinction emerged as a key category of those who were enabled to adopt mobile fintech (Figure 4.2). Participant A1 took this distinction further by saying:

> *"I think there are various ranges of interest in fintech across the income spectrum. But I think with the lower end it tends to be... In lower end of income, it tends to be in an USSD environment. And in the upper end, it tends to be like an investment type app like an EasyEquities or equivalent" (Participant A1*).

In summary, middle income customers' level of income determined not only the type of smart phone they owned but also the kind of fintech they were likely to adopt.

With reference to smart phones acting as an enabler for mobile fintech, Participant A1 also raised the issue of adopted customers not using mobile fintech applications on their smart phones:

> *"And I think sometimes there is a gap between intent and the use. When people think oh this is great idea, and maybe they download an app and then they don't actually end up using it" (Participant A1).*

This is a situation where middle income customer intent is present, hence the application is downloaded in the first place; however, the link with behavioural usage is broken. Participant A2 supported this point by sharing how the mass retail customer segment in cryptocurrency behaves after downloading the mobile fintech on their phones:

> *"Then there is a retail segment where they are more casual, they might buy for R 10 or whatever and keep it and not worry about it. Maybe they won't even log in to our app for a couple of months…. And some people buy and keep and never come back – I mean, not never, you see months later they come back to check their portfolio value and so on" (Participant A2).*

It was clear from these findings that application usage and continued engagement also requires additional enablers such as data, financial literacy, network coverage and other unknown factors. Therefore, external enablement is a combination of inter-related enablers that are required to work together to truly enable access, and thus the customer adoption, of mobile fintech.

The second category under the external enablement theme was external customer needs, which are perceived needs and ideas stemming from external social influence forces. The findings showed that such ideas were strong enablers for customers who were either status-driven to have "*a nice phone*", as Participant A1 put it, or who were influenced by "*network effects",* as Participant A3 explained, which spur many customers on to adopt mobile fintech. In both these instances middle income customers were externally driven to fulfil such needs. Participant A1 describes this:

"I mean South Africans are, you know we're a very aspirational culture. In the sense that we want nice things. And phones are definitely one of the bling things that we like. So I think people often pay over the odds. In terms of their income I think they'll pay over the odds for a nice phone. So it may not be that much of a good financial decision to buy a nice phone. But what does it give you, it gives you access to a whole bunch of other stuff which is really crucial" (Participant A1).

At the same time, Participant A2 had witnessed this customer characteristic within the cryptocurrency fintech segment, where such aspirational needs are more evident:

"So, I know that there are people, especially in the middle income group who want to 'get rich quick' right. And they look towards financial schemes to get them rich quick. So it's because of their lack of knowledge, they might get scammed by people" (Participant A2).

Scams are a negative occurrence for middle income customers who regard such external needs very highly, and as a result cut investment corners to get quick returns, as warned by Participant A2. However, this was also an insightful factor that not only characterises the middle income market, but also demonstrates the positive power of a perceived need that can take a customer from resistance and into adoption of digital applications such as mobile fintech.

II. *Theme 2: Inclusive Marketing Innovation*

The findings showed that inclusive marketing innovation was a defining theme that could build customer adoption depending on how mobile fintech companies attracted and marketed to diverse customer segments in the middle income market. The impact of inclusive marketing innovation on customer adoption is twofold. Firstly, "*having other consumers in mind*", as Participant A4 said, ensured that the product design would be more personalised and adaptive to different customers engaging with mobile fintech applications. Secondly, marketing should not target one type of affluent high income customer exclusively, as has been the case with some mobile fintechs in the past, but should contain messaging that s

localised by speaking the "language" of local consumers. Participant A4 remarked that it was apparent that:

> *"Typically, in South Africa, in particular there has been a complete lack of human centered design with other consumers in mind. So fintech providers typically are not thinking about low income or maybe even lower middle income consumers when they design their products and services. And then it's no surprise that that consumer segment then doesn't take it up. So I think a bit of a culture shift in the industry – away from designing for the high income consumer towards figuring out products and services that actually meet the needs of lower or middle income consumers is probably where the solution lies" (Participant A4).*

The need for cultural localisation for both the lower middle and upper middle income customer segments thus becomes an integral consideration as mobile fintech companies innovate and seek to positively influence the adoption of mobile fintech.

Another aspect of localisation is the need for mobile fintechs to cater for the changing income dynamics within the middle income customer segments, where price sensitive customers may not adopt due non-personalised pricing of fintech products and services. Participant A4 confirmed this:

> *"But I'd say even in the middle income segment, especially recently with depressed economy…I would imagine there's quite a lot of price sensitivity" (Participant A4*).

In light of the need for product and marketing innovation that is inclusive of customers coming from different income and cultural backgrounds, Participant A3 supports this position by advising for fintech entrepreneurs to also mirror the diversity that is evident in South African customers:

> *"I think we're not seeing diversity on the entrepreneurial front, and so what then happens is you see more copycat products from developed nations rather than organic products that actually speak to the needs of the local consumer. So, I think as – if there can be diversity in that front then you'll*

start to find a lot more novel products that actually speak to the real local on the ground need" (Participant A3).

It could thus be surmised that diverse entrepreneurial fintech players are better situated to create mobile fintech innovations that are more localised, in terms of product design and messaging, and inclusive to diverse customer segments in the both the higher and lower middle income band.

III. *Theme 3: Customer Needs*

Customer needs emerged as the third theme and covered a variety of categories that addressed the fulfilment of customer needs. These customer needs are a driving factor for customer adoption in the middle income market. The findings on customer needs firstly demonstrated financial needs as the most important for customers to make transactions such as payments and lending. Secondly, latent customer needs like the perceived ease of use and convenience needed to be adequately met to encourage customer adoption of mobile fintech.

As far as customers' financial needs were concerned, it was clear that payments was a primary customer need, hence its significant influence on customer adoption of payment fintechs. The researcher probed participants to understand better why payments were not only the most mature fintech segment in South Africa, but also currently the most adopted fintech product by customers. Participant A3 provided the following reason for this trend:

"Payments is the area where there is the highest level of adoption. Why? Because it is the most primary need that consumers have when we talk financial services. The need to be able to transact or pay for something. Or transfer money to somebody. So, it solves the most basic need" (Participant A3).

Although the ability to make payments was one of the primary customer needs, other mobile fintech segments such as insurance fulfilled customers' secondary needs. Participant A1, who worked in an insurtech described the rationale behind their business approach to increase customer adoption:

"So that's why we've designed the product to what we think is the need. And the need is that people earning up to R 30 000 a month are horribly under insured in South Africa" (Participant A1).

These statements are only two examples; however, mention of customer needs was frequently made in all the interviews, particularly in relation to financial services addressing a necessity like payments or providing a service like insurance for customers.

Latent customer needs was the second category under the customer needs theme. These needs must also be fulfilled, and are often tied into the service and product fulfilment of financial customer needs. As the findings showed, latent needs such as efficiency, convenience and speed had an impact on customers' adoption of mobile fintech in the middle income market. Participant A3 believed that customer needs to borrow particularly would encourage customer adoption of lending fintech because the credit screening and approval process was efficient:

"[Lending based fintechs] are willing to be more flexible than traditional institutions and so that's usually, going to trigger adoption. Also, just from a convenience perspective, rather than having to submit a whole lot of paperwork and going through a physical process. It's all digital, it's all a lot quicker" (Participant A3).

Participant A4 further underscored how mobile fintechs could address such latent customer needs by increasing the ease of use of their products and services:

"If you've ever tried to move from Standard Bank to ABSA or vice versa, you know how difficult it is to move all your accounts across. And that KYC the know your customer process can equally be extremely frustrating when you're trying to register a financial account… A lot of the fintechs you can do a selfie KYC where you don't have to you know go to a branch and give them a copy of your ID. You can just take a picture and send a digital scan of your ID…" (Participant A4).

In summary, it can be deduced from these findings that the customer needs factor was a key construct in the way mobile fintechs could, firstly, address real financial needs like to pay and to borrow. Secondly, practical latent needs of customers such as the need for product fulfilment or service delivery to be convenient and efficient ultimately drives mobile fintech adoption in this market.

IV. *Theme 4: Digital Ecosystem*

Several challenges to the creation of a digital ecosystem emerged from the findings, where both customer behaviours and industry required digital transformation for radical customer adoption of mobile fintech and other digital services to take place in the middle income market. Thus, the theme of a digital ecosystem emerged as all-encompassing for categories such as the positive impact of Covid-19 and the need for collaboration between traditional banks and non-bank fintechs to realise a digital ecosystem.

The Covid-19 pandemic in 2020 and 2021 has disrupted normal life, particularly for previously offline customers, by forcing many to adopt non-in-person contact digital solutions and products to abide by the rules of social distancing. The findings presented a resounding agreement that the impact of the pandemic had a continued effect on customers in two main ways. Firstly, the cash economy in the middle income market and the country at large was challenged, as expressed by Participant A3:

> *"I think now purely because of the situation [Covid-19], folks were forced to adopt digital alternatives. I think that then is gonna lead to a lot less use of cash among the middle income. I think the pandemic accelerated this" (Participant A3).*

In contrast to this sentiment, Participant A2, despite the witnessed digital acceleration, thought that cash use and mobile fintech use was:

> *"…Not mutually exclusive. I'm just saying that middle income group people still like to use cash for various purposes" (Participant A2).*

However, Participant A2 who owned a cryptocurrency fintech, went on to state that "*most of the crypto enthusiasts they probably just use digital*" *(Participant A2)* and not cash. So, depending on the kind of fintech adopted, findings tended to show that middle income customers had adopted more digital tools and mobile fintech apps into their behaviour because of the pandemic, thus contributing to the makings of a digital ecosystem.

The second way Covid-19 has positively impacted customer adoption is by accelerating the adoption curve and timelines for many mobile fintechs. Participant A2's local cryptocurrency business is a good case study for this:

> *"Earlier this year, before Covid, we were about 15 000 customers. That was last year Feb, so almost a year now. We are over 100 000, 110 or 115 000 [customers] right now. So about, we've added about 100 000 customers in the past 1 year" (Participant A2).*

Similar results were experienced by Participant A1, from a South African insurtech business.

> *"You know, in the last year we've seen an absolute turnaround in the adoption of our product... People have become aware of the product in a way that would have taken them another three years to become aware of it" (Participant A1).*

The second category under the digital ecosystem theme, which could positively influence customer adoption of mobile fintech in the middle income market, was collaborations between banks and non-bank fintechs. This theme was underpinned by the needed collaborations to unlock customer adoption by moving away from a competitive approach between the two players.

The findings suggested that because of the predominantly banked consumer base in South Africa, mobile fintech companies have thus far been competing against banks by selling their offerings to customers as substitutes or alternatives to banking; hence the slow customer adoption. Many in the predominantly banked population already use mobile banking apps, which in some ways locks customers into a banking ecosystem.

"If you think about banking, these days you cannot really do any banking without a mobile app. I think FNB is an example where they don't even allow you to do anything if you don't have the app installed on your phone" (Participant A2).

This locked in approach extends into the current competitive relationship between the non-bank mobile fintechs and banks, which Participant A4 described the distinction and competitive approach as "*not meaningful"* in the South African context. He continued:

"As the big banks in South Africa have been fairly successful at absorbing a lot of the innovation that's happened outside of the banking sector into their internal operations" (Participant A4).

Therefore, in many ways the banks could be considered as the "*market leaders of fintech" (Participant A4).* In addition:

"The big 5 banks are all investing an enormous amount in using propriety technologies themselves, in the way that they transform" (Participant A4).

This indicates a high level of digital transformation within South African banking and emphasises the need for both non-bank fintechs and banks to foster a collaborative approach for the purposes of stimulating customer adoption for more efficient and innovative mobile fintech products.

Participant A3 provided further insights into slow customer adoption of non-bank mobile fintech in the South African customer market:

"South Africa is unique in that. It's one of those emerging markets with high banking penetration, much like the developed countries" (Participant A3).

Therefore, the findings show that markets with high banking penetration will probably not replicate the massive successes of mobile fintechs such as M-pesa - similar to other emerging African markets. As a result, South African banks could continue to maintain a large customer market share unless a different approach is employed. Hence, the theme of a digital ecosystem was

important as it encouraged a collaborative effort. Participant A4 concurred with this position and suggested how a digital ecosystem could be realised:

> *"The future of banking and fintech is more about that ecosystem approach where you might have, a bank who owns the customer relationship. But underneath the bonnet of the bank, you're probably going to have a lot of independent fintechs offering technology services and solutions that the bank is putting into its service offering" (Participant A4).*

V. *Sub-Themes: Trust, Product Value and Digital Behaviour*

The three sub-themes of trust, product value and digital behaviour were common points discussed throughout the interviews. The participants provided many ideas on what contributed to customer adoption of mobile fintech. These three factors were extracted and grouped together by the researcher to demonstrate the indicators of adoption behaviour by personifying them as an adopted customer.

i. *Sub-Theme 1: Digital Behaviour*

In terms of digital behaviour, it was evident from the findings that:

"The kinds of consumers that are adopting fintech they tend to be digitally literate, very sophisticated and already fulfilling a variety of needs digitally or online" (Participant A3).

This view was confirmed by Participant A1 who described the high probability of digital natives possessing the markers of digitally transformed customer behaviour:

> *"So I think they are very comfortable with ecommerce. I think there may even be people in the middle income group who are also very comfortable with ordering online from internationally" (Participant A1).*

Moreover, further findings revealed a strong relationship between middle income market customers who adopted mobile fintech and their adoption of retail e-commerce. Such a relationship suggested that digital customer behaviour in one

online area such as e-commerce could attract customers to novel mobile fintech products that they might not necessarily have been familiar with. Participant A4 further emphasised this relationship by defining an adopted customer as having behaviours that cross through different digital uses and services, in other words:

> *"Somebody who engages in the digital world in other parts of their lives – social media, online shopping, e-commerce" (Participant A4).*

ii. ***Sub-Theme 2: Trust***

The findings for the sub-theme of trust revealed that trust was an overwhelming factor that did not drive customer adoption of mobile fintech but rather impeded it, particularly for the middle income market in South Africa. Hence it was necessary that the trust construct was present in an adopted customer. The researcher probed participants for reasons behind a lack of trust in mobile fintech, and their responses were:

> *"One of the problems in fintech is a lack of trust. I would rather keep my R 5000 in the bank than invest and lose it all. So, I think that's where trust comes in. So, if I don't trust something, I'd rather not use it. Especially when it comes to middle income, I think they're – I think that's one of the factors I personally believe is a critical one" (Participant A2).*

> *"So, I think if you trust somebody, or you trust an institution then other stuff you can probably forgive. Like if the app doesn't work so properly or the thing takes a bit longer than you were expecting or whatever. You'll think to yourself that it's okay, I know I can trust them" (Participant A1).*

It was clear from such responses that trust in an unfamiliar product such as mobile fintech may have created scepticism in the middle income customer. Other participants contradicted this idea and raised another interesting aspect of trust, as some middle income customers were digital natives. Participant A4 reasoned why digital natives were probably the most typical mobile fintech customers in South Africa:

"Because they are more familiar with transacting digitally. And have less trust and credibility issues" (Participant A4).

Furthermore, overcoming the trust barrier is a challenge for local mobile fintech companies to build trust in an increasingly digital world for a diverse customer base that has varying degrees of trust could be difficult. However, the findings showed that it was possible "*to create a brand trust in an online environment*", as Participant A1 put it, and thereby drive customer adoption of mobile fintech applications in the middle income market.

iii. *Sub-Theme 3: Product Value*

The findings showed that product value was a third sub-theme that related to trust and digital behaviour in the adopted customer. The main finding was that a lack of perceived product value from a middle income and mass market perspective was related to a lack of awareness.

Participant A2 shared his/her experience from the South African cryptocurrency industry, where adoption by the retail mass customer market remains slow compared to the pro trader customer market, because of a lack of awareness:

"The retail market, like I was talking about, they're still quite unaware. Still quite like, like the Joe on the street they don't know what cryptocurrency is or bitcoin is. And once this reaches like fever pitch, when the bitcoins like in everybody's vocabulary. Every Tom, Dick and Harry is going to try get into this – into the business of buying it" (Participant A2).

It must be noted from this finding that there is a precondition to rapid customer adoption, and that is only when bitcoin or cryptocurrency is in the common vocabulary of customers - meaning they should be aware and familiar of the product first prior to rapid mass customer adoption.

For cryptocurrency specifically, findings showed that increasing global interest and investment in cryptocurrency has raised its product value in the international fintech market. Participant A2 talked about the increasing

product value of the mobile fintech product itself despite a lack of awareness amongst mass retail customers of benefits and possible financial returns:

> *"So this is institutional interest at unprecedented levels. And the price of cryptocurrencies have increased based on these investments from these corporates [global investment firms]" (Participant A2).*

It was on this basis that Participant A2 projected the following trajectory for retail customer adoption of cryptocurrency in the South African customer market:

> *"It is going to go parabolic in my view in the next year. Not even in the next 2 / 3 years. Just in one year I think the retail adoption, is going to be mind-blowing. And, in fact, our goal for this year is to get from 100 000 odd customers to a million customers. So, and I think it's very much doable" (Participant A2).*

Participant A4 expressed a similar belief on the relationship between a lack of awareness of the product value of mobile fintech affecting the lack of adoption:

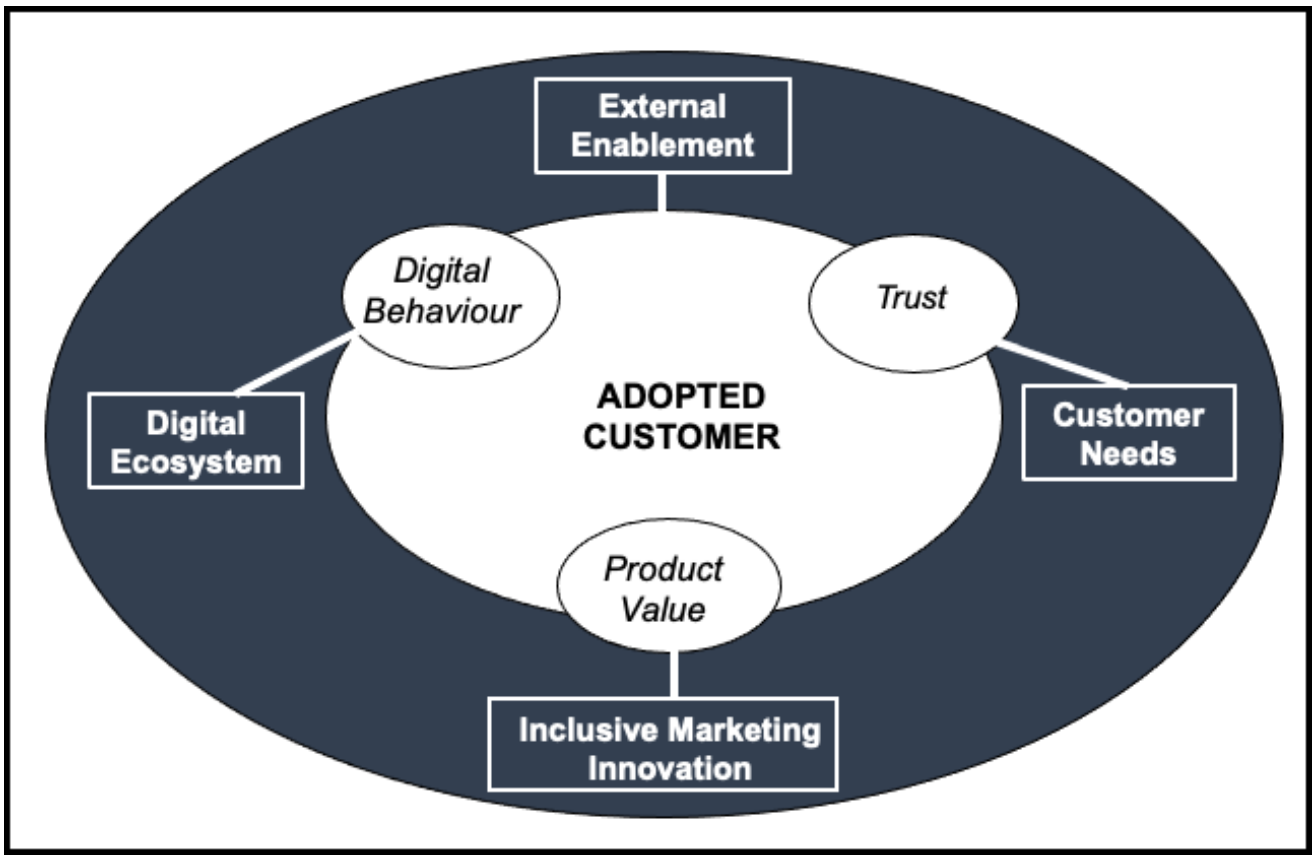
> *"I would imagine also potentially awareness, so not necessarily they mistrust the solutions but they're not necessarily aware of what the benefits of using it would be" (Participant A4).*

4.5.4 *Summary of interview findings (Part 4)*

The findings that emerged from the thematic analysis (TA) were discussed in this chapter. In response to research question 3, four themes and three sub-themes were identified and presented as factors that influenced the customer adoption of mobile fintech in the middle income market. As advised by Merriam (2009), the researcher chose to graphically depict the interplay of the themes (Figure 4.4) as an outcome of TA.

i. ***Adopted Customer: Conceptual Model***

Figure 4.4: Conceptual Model of Linked Themes for the Adopted Customer



This conceptual model was designed to show how the factors found were connected and thus to provide a better explanation of customer adoption of mobile fintech.

The outcome of the TA is expressed (Figure 4.4) as a circular graphic that represents the factors that influence the customer adoption of mobile fintech in the South African middle income market. This was viewed through the lens of a fully adopted customer. The outer circle layer shows the four themes that enable middle income customers to become adopted customers. In addition, the figure intentionally omitted directional arrow shapes so that the circular layers depict the interconnected nature of customer adoption.

These four themes showed related relationships with the sub-themes that made up an adopted customer:

- Customer needs that are met enables to the adopted customers to have high trust.
- Inclusive marketing innovation enables the adopted customer to understand the product value of mobile fintech.
- A digital ecosystem enables the adopted customer to behave in the digital world with increased engagement (digital customer behaviour).
- External enablement allows the customer access to the resources required to become an adopted customer.

Lastly, the inner circle represents the adopted customer with the three overlapping factors of digital behaviour, trust and product value that intersect.

4.6 Findings for Research Question 4

RQ4: Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech services?

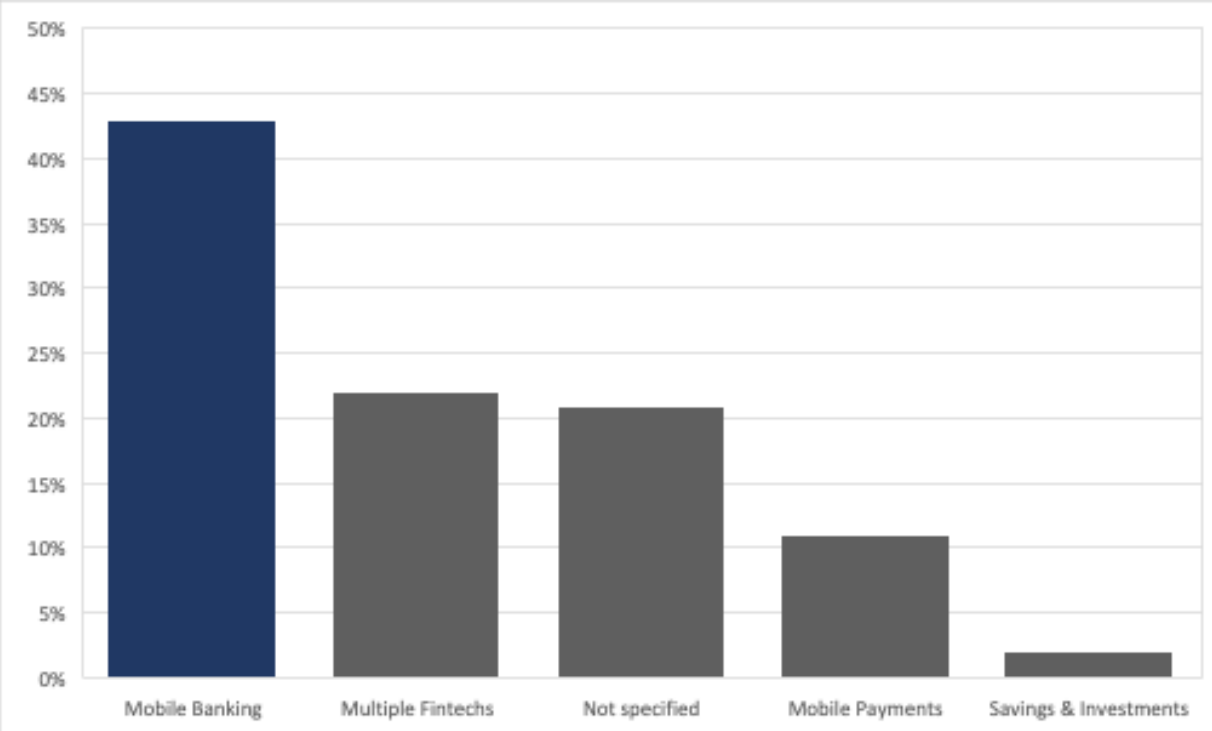
4.6.1 *Part 3: Open-ended findings*

In order to explore the proposed relationship between digitally transformed customer behaviour and the adoption of mobile fintech (RQ4), four open-ended questions were posed to respondents in the questionnaire. Through a process of quantisising the response data as part of the content analysis technique (Merriam, 2009), the following findings emerged and are represented primarily with frequency analyses. In addition, the researcher derived categories from common phrases provided by respondents. Each question below aimed to determine whether a relation existed between customer financial needs being met digitally, and also to understand the level of fintech penetration in customers according to their digital profile. The questions asked are listed below with the categories.

- Question 1: Have you used mobile fintech applications before? If yes, please name the application and detail your experience. If not, please explain why not *(Category: current fintech segment analysis)*
- Question 2: What type of mobile fintech product do you want to use in the future, besides payments? Examples are insurance, lending, investments, online trading, cryptocurrency etc.? *(Category: future fintech segment penetration analysis)*
- Question 3: Do you conduct all your personal financial transactions digitally - either on a mobile app or online? *(Category: digital behaviour analysis)*
- Question 4: Do you use mobile fintech applications for all your payment needs?
    - Question 4.1: If no, please select the amount of cash payments you make in a month. *(Category: offline behaviour analysis)*

I. *Q1: Current Mobile Fintech Penetration Analysis*

Figure 4.5: Results of Current Mobile Fintech Usage

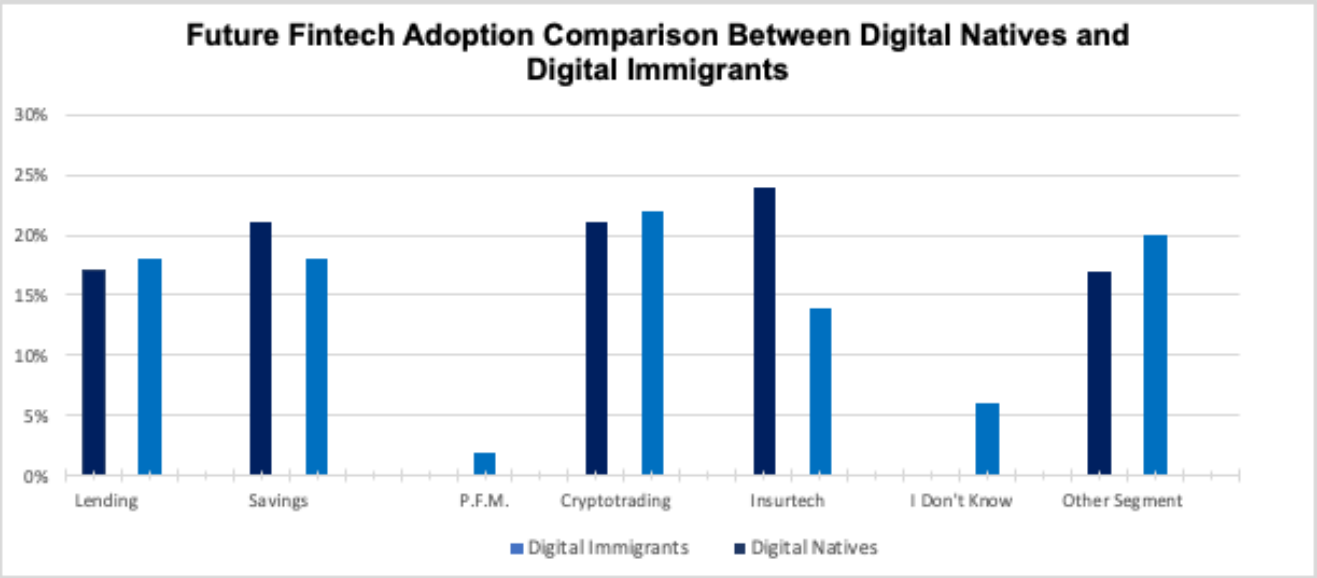


The largest proportion of respondents considered and used mobile banking (42%) as their primary mobile fintech application (Figure 4.5). This was a significant finding as many respondents named traditional banks such as FNB, Capitec and Standard Bank apps as mobile banking applications they used. Therefore, mobile banking had the highest level of penetration for this middle income market sample.

The second and third group were those who used a variety of mobile fintech applications (22%), and others who either misunderstood the question or simply answered ‘yes’ without specifying the kind of mobile fintech they were currently using (21%). The smaller proportion of usage comes from those who used Mobile Payments (11%), where mobile fintech payment applications like SnapScan and Zapper were named. The smallest mobile fintech segment used by this sample was Savings and Investments (2%) with applications such as EasyEquities.

II. *Q2: Future Mobile Fintech Penetration Analysis*

Figure 4.6: Results of Future Mobile Fintech Adoption



This sample was divided between digital immigrants and digital natives and these two digital profiles made up 82.4% of the sample (Table 4.3). These two profiles are compared in Figure 4.6 according to the fintech segments that emerged as the most desired mobile fintech applications for use in the future. This graph firstly shows that Digital Natives were most likely to want to use Insurtech (24%), followed by Crypto-trading (21%) and Savings (21%). On the other hand, the majority of Digital Immigrants were most likely to adopt Crypto-trading (22%) in the future, which forms part of the investment portfolio. 'Other segments' (20%) followed, and Savings and Lending (both at 18%) were marginally behind Crypto-trading.

A major finding was that both digital profiles revealed similar fintech interests without showing outright differences. It was noted, however, that many more Digital Immigrants indicated that they were uncertain, with the 'I Don't Know' (6%) option featuring more significantly in this group than for Digital Natives. Both Digital Immigrants and Digital Natives' responses grouped under 'Other Segments' (between 17% and 20% for both profiles) where customers wrote a myriad of segments such as payments, banking or simply 'I want everything', which underlined a minority of responses that could not be generalized with the rest of the other fintech segment interests.

III. *Digital Behaviour Analysis*

Table 4.18: Results of Open-Ended Questions on digital financial behaviour

Question: Do you conduct all your personal financial transactions digitally?

Yes Responses		**No Responses**	
n	%	n	%
118	76	38	24
Category	**Sample comments**	**Category**	**Sample Comments**
Convenience	*Ease of interface with the bank*	Need Human Contact	*Prefer dealing with a real person!*
	It is easier and convenient for me. You get to do most stuff at your own comfort		*Some require physical contact with the bank.*
Efficiency/ Speed	*Very convenient, time serving, fast, user friendly and cheap*	Cash Economy Contact	*Most of my transaction. But some require cash...small merchants,*
	Safes me time to queue in the Bank		*Some employees prefer to be paid in cash, so not all my transactions*

Four common categories emerged out of the content analysis from respondents who were asked if all their personal financial transactions were conducted digitally. Eight sample comments are provided in Table 4.18 for both 'Yes' and 'No' answers. It was calculated that 76% of the 'Yes' respondents wrote comments which could be categorised in two common categories of 'Convenience' and 'Efficiency/Speed' which amount to the majority of 118 respondents (n).

In contrast, the common categories for the 'No' commentary responses were 'Need Human Contact' and 'Cash Economy Content' from 38 respondents (n), which is 24% of the sample. Therefore, these overall four categories emerged as the concepts linking responses from those digitally adept (the Yes group) versus the not wholly digitally adept group (the No group).

IV. *Offline Financial Behaviour Analysis*

Table 4.19: Results of Digital Payments Frequency

Question 4: Do you use mobile fintech applications for all your payment needs?		
Variable	**n**	**%**
	160	**100**
Yes	97	61
No	63	39

From an initial sample size of 216, only 160 respondents (Table 4.19) reached this stage of the questionnaire and responded to questions on the extent of their digital financial behaviour concerning payments. More than half the respondents (61%) claimed to conduct all their payments through a mobile fintech application. A smaller but still significant percentage of respondents (39%) reported using offline methods such as cash to make payments.

The results from the next sub-question (shown in Table 4.20) only had 63 out of the 160 respondents complete this part of the questionnaire. Table 4.20 is an analysis of the 'No' responses, of middle income customers who stated that they do not use mobile fintech applications for all their payment needs.

The follow up question requested for customers to indicate the number of cash transactions they performed per month. And by selecting the amount of cash transactions, customers demonstrated whether they were high or low cash users. This analysis (Table 4.20) also shows the extent of respondent offline cash-use behaviour according to their digital segment identity. It was found that the majority of the high cash users were from the Digital Immigrants segment (40%), with three or more cash transactions per month. The Digital Natives paled in comparison as they showed very little cash use (13%). The remaining digital segment identities are not reflected here due to their small numbers.

Table 4.20: Results of Offline Financial Behaviour (Cash Payments)

Question 4.1: If no, please select the number of cash payments you make a month?			
Variable	**Digital Profile**	**n**	**%**
		63	100
High (3+ cash transactions)	Digital Immigrants	25	40
Low (1 – 2 cash transactions)	Digital Immigrants	10	16
High (3+ cash transactions)	Digital Natives	8	13
Low (1 – 2 cash transactions)	Digital Natives	7	11

CHAPTER 5. DISCUSSION OF RESULTS / FINDINGS

5.1 Introduction

This chapter presents a detailed discussion of the results and findings presented in Chapter 4. The results and findings were discussed in relation to the literature reviewed earlier in this report. The discussions were grounded in fulfilling this study's two research objectives which are to firstly examine the barriers and facilitators of customer adoption. The second research objective is to explore the relationship between digitally transformed customer behaviour and the customer adoption of mobile fintech in the South African middle income market.

The convergent design of this study allowed each instrument part to be separately presented and analysed in Chapter 4. This chapter integrates those results and findings. This was done by addressing two research questions with separate discussions each (RQ1 and RQ3), and the other two research questions (RQ2 and RQ4) were answered with mixed method discussions. Figure 3.1 demonstrated the convergent design flow. In this way, all four instrument parts collaborated and provided the anticipated enrichment that come with mixed method studies. This chapter first discusses the demographic profile of the primary sample. Thereafter, each research question is addressed as follows:

- ***Research Question 1*:** Separate discussion of Instrument Part 1 results (UTAUT-TAM).
- ***Research Question 2*:** Mixed discussion between Instrument Part 1 results (UTAUT-TAM) and Instrument Part 2 findings (Barrier Instrument)
- ***Research Question 3*:** Separate discussion of Instrument Part 4 findings (Semi-Structured Interview).
- ***Research Question 4:*** Mixed discussion between Instrument Part 3 (Open-Ended Questionnaire Questions) and Instrument Part 4 (Semi-Structured Interviews)

5.2 Demographic profile of primary sample - discussion

5.2.1 *Primary Sample Achieved - discussion*

Table 5.1: Summary of majority sample achieved for questionnaire part 1

Variable, Majority Variable	% of Sample
Household Income, *R 25 000 or more*	56.9
Age group*, 21 – 35 age*	56.5
Internet usage*, 2 - 3 hours daily*	91.2
Digital Profile, *Digital Immigrant*	61.1
Gender, *Female*	52.3
Mobile Fintech segment, *Mobile Banking*	42
Highest qualification, *Postgraduate*	62.5
Citizenship, *South African*	87.1

The population targeted for this study were adult respondents who earn an income, own a smart phone and have experience with mobile fintech. A snowball sampling technique was used to achieve the primary sample size of 216 usable responses. This section is a discussion with literature on the characteristics of the achieved sample and references the majority percentages in Table 5.1.

The sample results for gender were fairly split between males and females, however most respondents were female at 52.3%. A diverse gender split was observed within mobile technology literature where some cases observed a majority of male respondents (Yang et al., 2012) whereas other cases are similarly an equal 50/50 split (Matemba & Li, 2018). Or there can alternatively be an overwhelming majority of female respondents at 71.6% as per Al-Saedi et al. (2020). Therefore, the fairly equal gender split was taken as typical for studies of this nature.

As far as it is known to this study, literature that characterises samples according to digital profiles such as of Digital Aliens, Digital Laggards, Digital Immigrants or Digital Natives was atypical to mobile technology studies. Other digital customer segmentations used are terms like generation Z, otherwise the profiles names used here are more prevalent in e-learning and student population studies as exemplified by Smith (2012) Thinyane (2010).

Nonetheless, there are some mobile technology studies which segment customers in terms of age generations like the use of the Millennial profile which is closely related to this study's Digital Natives profile. According to Thusi and Maduku (2020), Millennials are an attractive customer segment to financial institutions because of their digital adeptness and higher propensity to adopt new technologies as a young generation. Since most of this study's respondents did not self-identify as Digital Natives although they theoretically fit into the Millennial customer segment, it is important to note the generational mis-match.

The mis-match was exemplified in how the majority of this study's sample self-identified as Digital Immigrants (61.1%), due to only becoming accustomed to the digital world as adults and were offline as children (Prensky, 2001). However, with a sample majority that was 35 years old and younger (56.5%), this study found an interesting nuance where this relatively young in age Millennial group self-identified as Digital Immigrants - and not Digital Natives as possibly assumed.

Digital Natives, in comparison, is a term coined by Prensky (2001) and this segment is characterised by their fluency with digital tools and technologies. Prensky notes Digital Immigrants have developed a similar digital fluency over time however the old "accent" from the past is a visible marker (Prensky, 2001, p. 2) of their recent immigration into a digital world. This is because Digital Immigrants might still instinctively prefer offline methods of engagement for various reasons. The implication for the mobile fintech business context here may be to design hybrid customer experiences (digital and offline) that cater for middle income customers whose behaviour is not entirely digital and, in some instances, might prefer offline methods of engaging financial products and services.

Venkatesh et al. (2012) originally conceptualised the experience construct as an individual's experience with a technology over a period of time. Alshehri (2012) evolved this variable into general internet experience to show that the likelihood of technology acceptance increases for experienced internet users. It was for this reason that this study used internet experience as a contributing digital profile factor to help characterise and inform the level of digitally transformed behaviour for middle income market customers. Therefore, when this samples majority of

Digital Immigrant profiles was combined with their high daily internet usage of 2 - 3 hours, then this sample became characterised by respondents who were very immersed in a digital world, in terms of their current life stage and digital consumption - despite the lack of early exposure to digital technologies.

This sample was predominantly made up of South African citizens and South African residents, with a combined percentage is 100%, and so this sample was not generalisable or applicable to another geographic location beyond the country. The dominance of South African respondents was intended for this study, due to the contextual research gap raised in Chapter 1's problem statement.

In addition, this sample was highly educated with more than 60% holding a postgraduate qualification. The education significance was likely due to the snowball sampling technique used where a bias could exist in the initial survey group. In this study's case the initial survey was first administered to postgraduate students hence the sample was highly characterised by educated respondents. Moreover, the sampling technique might have also impacted the income levels where most respondents (56.8%) belonged to households that are above lower middle income customers resulting in a majority of R 25 000 monthly net income earners.

5.2.2 *Middle Income Market - discussion*

The literature review raised the contentious nature surrounding who qualifies as middle income, particularly in the South African context where both class and income are historically along the lines of race, gender and class (Zizzamia et al., 2016) due to the country's history of inequality.

An approach from Visagie and Posel (2013) was used to conceptualise this study's understanding of middle income market, and to also determine the lower bound value for the middle income customer. The resultant sample was mixed with some respondents not reaching the lower bound value, but qualifying at a household level instead. In addition to some initially unqualifying lower middle income respondents, it was also unclear how affluent the upper middle class was

as almost half the sample could be classified as upper middle class (individually earning R 25 000 and more on a monthly basis). This meant that the initial approach was restrictive, and a different approach was undertaken where respondent household values were combined with individual income values and thus included in this study. Appendix G shows the qualifier strategy that this study used, where respondents who marked one of the four income options (A to D) could only qualify as a sample respondent should their households earn the same or more than their individual income selection.

This study justified the departure from calculating per capita / head only and utilizing household values instead, because additional research showed that an individual's welfare is dependent on the other household members and they are not only reliant on their own income (OECD, 2020).

Further to the debate on the qualifiers for middle income, this study also recognized the need to discuss the divergent monetary values as defined by other scholars when categorizing individuals into this market. Debates in literature include Visagie and Posel (2013), Burger et al. (2014), Prahalad and Hart (2002) for South African middle income thresholds, as well as Chironga et al. (2018) who state that African middle income customers earn between $6 000 and $36 000 which roughly translates to R 7 152 - R42 997 per month (the exchange rate was R 14,30 to the dollar at the time of this report). In comparison, this study's initial use of a minimum monthly value of R 3 656 per individual (Visagie & Posel, 2013) showed an inability to appropriately profile and provide up to date threshold values for middle income customers. A possible reason for this inability is provided by FinMark Trust research which states that only 34% of South Africans earn above R 3 520 per month (FinMark Trust, 2017). This minor percentage gives little room for the middle income market, and consequentially a very small customer segment to target. It also demonstrates how transient the income definition for middle income market is - much like the customers themselves that are also highly likely to move between income brackets over time.

Moreover, the construct becomes more complex when terms such as middle income, lower and upper middle income were used in this study in absolute terms. Additional research showed more appropriate segmentation approaches for

naming and capturing the middle income segment, where for example, middle class South Africans were defined as “stable middle class” (20%), or “vulnerable middle class” (15%) or “elite” (4%) (SALDRU, n.d.). Furthermore, despite this study’s interchangeable use of middle income, upper and lower middle income terms, the middle class definitions proved to be noteworthy for this study’s middle income definition due to the need to use both a socio-economic and financial customer market lens’ for this customer segment. In summary, the classification terms for middle-class from SALDRU proved to challenge the initial conceptualisation of this study’s middle income market construct. As a result the middle income market sample could have been better assessed for their vulnerability to falling into poverty or their stability status (Zizzamia et al., 2016) within the middle income market bracket.

This study also acknowledged its reliance on self-reported income values from sample respondents. This could be an unreliable method to qualify a sample hence the Living Standards Measurements (LSM) metrics do not measure income (Prahalad & Hart, 2002) when researching customer affordability.

The interview findings provided a relevant finding to the middle income market debate, where a participant recommended for non-bank mobile fintech companies to differentiate themselves by segmenting their prospective customers according to indicators besides income. Since the big five banks in South Africa traditionally segment customers according to demographic indicators such as income, gender, race or professions, it would thus serve mobile fintech companies to consider an alternate approach. Moreover, another interview participant confirmed that lending fintechs, specifically, were already differentiating themselves by assessing customers for credit through their social media behaviour or airtime buying habits. Thus, the lending fintechs approach could be extended to be used by other mobile fintech companies as a segmentation approach that better captures the changing customer landscape in South Africa particularly in the middle income market.

In summary, the demographic profile for this study’s middle income market sample was an integral unit of analysis and discussion. Therefore, the impact of which qualifiers to use and how income market research on this matter has

transformed through the years were key factors to discuss in relation to the achieved sample and related literature.

5.3 Research Question 1 Discussion

***RQ1**: What are the middle income market's adoption barriers and facilitators of mobile fintech?*

The barrier and facilitator outcomes were articulated in terms of the significant predictor constructs found from this study's UTAUT-TAM model results. Firstly, the two positive predictors of attitude (ATT) and behavioural intention (BI) were found to be facilitators to the customer adoption of mobile fintech. In addition, utilitarian performance expectancy (UPE) also became a facilitator when moderated by digital profile (DIGIP). Secondly, self-efficacy (SELF) was the only negative predictor and thus barrier construct. Overall, these four significant predictor constructs are discussed in this section, as well as the non-significant constructs.

The study noted that the dependent variables of BI of USE were theoretically positioned in the model as indicators of customer adoption. The outcome from the final structural model demonstrated that BI (p-value <0.01) explained 60.5% of the variance. In turn, BI had a significant and positive influence on USE (β= 0.632; t= 6.253; p-value <0.01). Consequently, this study's final model (Figure 4.1) exhibited comparative predictive strength of customer adoption - in terms of variance.

When this study's model variance was compared to a similar UTAUT study in mobile banking, Yu (2012) was able to explain 60.4% and 65.1% for BI and actual usage respectively. Another UTAUT-based study by Shin (2009) showed a high R-squared value of 71% to explain the usage of mobile wallets. It was also noted that both of these studies used similar moderators of age (Yu, 2012), income (Shin, 2009), and are also located within mobile technologies.

5.3.1 *Predictors of BI*

I. *Attitude - Facilitator (Positive Predictor)*

The original UTAUT-TAM model conceived by Khalilzadeh et al. (2017) credits Attitude (ATT) as the key reason their integrated version of UTAUT and TAM models had higher predictive and explanatory power at a variance of 87.1% to explain BI for mobile payment technologies.

In comparison were the results of other mobile technology studies, which utilized the original UTAUT and UTAUT2 models by Venkatesh et al. (2003), where much less significant variance was found at 70% (Baptista & Oliveira, 2015). Thus, the predictive model from Khalilzadeh et al. (2017) attributed its variance strength to the inclusion of attitudinal variables such as ATT and SELF. These attitudinal variables were borrowed from the TAM model and provided greater explanatory power to the integrated UTAUT-TAM model version. In this study, ATT was also included and found to have high significance and positively predict BI (β= 0.550; t= 3.382; p-value<0.01). Therefore, Hypothesis 9 was rejected as a barrier relationship to BI, but it was accepted as facilitating a relationship to BI and thus customer adoption of mobile fintech.

According to the TAM model by Davis (1989), consumers with positive sentiments towards a technology are more likely to create the intention that will impact their behavioural use towards that technology. Furthermore, in a critical review where 162 studies on the acceptance of Information Systems and Information Technology systems were examined; Dwivedi et al. (2017) asserted the same result as Davis (1989) where attitude played a significant role for both consumer intentions and usage. Moreover, local South African research on bitcoin customer adoption also exemplified similar results where attitude emerged as a significant facilitator amongst variables of perceived behavioural control, subjective norm, and the perceived benefit of Bitcoin (Walton & Johnston, 2018).

In contrast is Venkatesh et al. (2003) whose original UTAUT model excluded attitude because it was considered as a precursor to the independent variables (Khalilzadeh et al., 2017). Despite this, it seems attitude became more relevant and necessary for financial technologies like mobile fintech when compared to

non-financial technologies or internet services where customers attitudes might not be as significant.

The implications for this study, was how the middle income market's (MIM) positive regard and feelings could facilitate the adoption of mobile fintech. Technology developers and fintech managers could take advantage of this outcome by being cognisant of the psychological association's consumers make and continue to make about mobile fintech products and services. Thus, shaping customer attitudes is integral (Dwivedi et al., 2017) to customer adoption and can be sought through customer research, enhanced customer experiences (CX) and building positive brand psychological associations.

II. *Behavioural Intention - Facilitator (Positive Predictor)*

The BI variable was found to be highly significant and a strong predictor of USE (β= 0.632; t= 6.253; p-value<0.001). Therefore, Hypothesis 11 was accepted as a facilitating relationship to the customer adoption of mobile fintech in this middle income market sample. The strong and predictive influence of BI on USE is proven and validated by Venkatesh et al. (2012) who found 26% of usage in mobile banking was explained through the Facilitating Conditions (FC) and BI relationships. At 28.8%, this study showed decent explanation of USE which is slightly higher than Venkatesh et al. (2012).

This study noted both Merhi et al. (2019) and Khalilzadeh et al. (2017) excluded usage (USE) from their extended versions of the UTAUT model due to prevalent findings that BI predicts USE. In contrast, this study included USE as a second dependent variable with a causal relationship to BI due to the different research context of this study. This study's modified UTAUT-TAM model also sought to test the proxy assumption held by Khalilzadeh et al. (2017) and others, and the results confirmed that BI is indeed a strong predictor of USE with the variance in mobile fintech usage (USE) explained by 63.2%.

This result indicated that customer willingness or plan to adopt mobile fintech should lead to actual usage. However, since intention in itself was a dependable variable meant that the strength of the ten independent variables (IV) acted as motivators and determined the amount of willingness or intent that customers had

to adopt. Nonetheless, should the willingness be established as exemplified by this study's BI results, then the likelihood of usage is inevitably strong.

III. *Self-Efficacy - Barrier (Negative Predictor)*

Self-efficacy (SELF) was measured as the customers perceived capability to perform or complete a task. Results for SELF were shown as highly significant yet as a negative predictor of BI (β= -0.131; t= -1.767; p-value<0.007). Therefore, Hypothesis 6 was rejected as a facilitator but accepted as a barrier relationship to the customer adoption of mobile fintech in this middle income market sample.

This result was a departure to some noteworthy mobile technology literature which demonstrated SELF as both insignificant and not a facilitator of BI. For example, Venkatesh et al. (2003) found customers to better capture SELF through Effort Expectancy (EE) as opposed to a direct significant relationship to BI (Yu, 2012) hence it was removed from the refined UTAUT model. Khalilzadeh et al. (2017) then re-introduced SELF from TAM because of its attitudinal nature, however it resulted to be an insignificant influence on BI.

Despite this, there was existing mobile banking studies which showed the significance of SELF as direct determinants of BI, but this relationship had been significant at a reduced measure over time, when compared to factors such as Social Influence (SI) (Yu, 2012). The low impact of SELF in these studies could be due to the experience and confidence consumers have generally gained over time with digital technologies (Yu, 2012). In contrast was one recent study in mobile payments which confirmed SELF as a positive and significant determinant of BI, where it was advised for developers to sustain perceived customer self-efficacy by shortening the amount of time required from customers to perform a task on a mobile application (Al-Saedi et al., 2020).

The highly significant yet negative BI relationship of SELF in this study, indicated that this sample has a low-self-perception regarding their internal capabilities to use mobile fintech. SELF thus becomes an impediment to their adoption. This inverse effect on BI was a surprising result for middle income market customers who are banked, own and engage with mobile phones, and possibly implies an over-estimation of the customer readiness of middle income customers.

Moreover, this study anticipated security-related constructs such as Risk, Trust and Security to emerge as significant barriers to customer adoption, similar to the predictor results from Khalilzadeh et al. (2017). However, it was found that the impediments to customer adoption were more attitudinal, and customer-perception related as opposed to assumed factors that are security and risk related.

IV. *UPE - DIGIP - BI: Facilitator (Positive Predictor)*

Utilitarian Performance Expectancy (UPE) was measured as the customers perceived usefulness of a technology to perform certain tasks (Khalilzadeh et al., 2017). Results for UPE's direct impact onto BI were initially insignificant, yet when moderated by digital profile (DIGIP) the relationship was strengthened. Thus, the moderation effect for the latter relationship was shown as highly significant and positively predicted BI (β= -1.083; t= -2.581; p-value<0.010). Therefore, Hypothesis 4b was accepted as a facilitating relationship to the customer adoption of mobile fintech in this middle income market sample.

Mobile technology results from global literature demonstrated UPE as a mediating variable to EE or Perceived Ease of Use (Khalilzadeh et al., 2017). Whereas, local cryptocurrency acceptance literature showed UPE as an independent variable that predicted ATT (Walton & Johnston, 2018). These different model outcomes, between the UPE and BI relationship, demonstrated that UPE becomes a stronger construct when technology models moderate or mediate it with other constructs - which was the case with this study's DIGIP moderator.

Shin (2009) advised for studies to differentiate themselves with the use of moderators that further extend the usual demographic moderators such as age and gender. This study took heed and successfully found moderation effects of DIGIP on the relationship between UPE and BI. This meant that customers with higher digital behavioural activity, such as regular internet usage combined with digitally immersed profiles, positively influenced the BI of mobile fintech. The implication here for mobile fintech businesses may be that customers with a

higher propensity to the digital world could be the early adopters of mobile fintech as a higher number of their utilitarian needs are met digitally.

5.3.2 *Non-Significant Factors*

I. *Negative Predictors*

The initially hypothesised barrier constructs for this study's model were Security (SEC), Trust (TR), Risk (RI), Facilitating Conditions (FC) and Attitude (ATT). However, none of these constructs resulted to be significant to BI. Instead, Security (β= -0.166, p-value= 0.365), Facilitating Conditions (β= -0.289, p-value= 0.593) and Hedonic Performance Expectancy (β= -0.168, p-value= 0.340) resulted as the negative barrier relationships with BI, albeit with insignificant relationships to BI.

II. *Non-Significant Moderator: Middle Income Market (MIM)*

According to Shin (2009) income is a powerful moderator for technology acceptance studies due to its ability to demonstrate customer purchasing power and their level of demand for a product or service. Income is also used in multiple industries for customer segmentation purposes (Shin, 2009) hence its inclusion in this study.

Moreover, the results from Shin (2009) demonstrated that income had a significant moderating effect between Trust and BI as well as Security and BI. Therefore, it was unexpected for middle income market (MIM), as a moderator in this study, not to bear any statistical significance on the proposed variables of FC, UPE and Trust (TR). Results were as follows: FC-MIM: p-value= 0.520; UPE-MIM: p-value= 0.465; TR-MIM: p-value= 0.955. The implication here was that income is an insignificant factor should a customer be affluent middle income, or in the lower middle income band when considering the FC, UPE or TR impact on their adoption.

5.4 Research Question 2 - Mixed Method Discussion

RQ2: *How do the qualitative findings further explain the customer adoption barriers of mobile fintech, as measured quantitatively, according to middle income market customers?*

The second research question was a mixed method question where the qualitative findings and quantitative results were mixed for a greater explanatory purpose. Thus, the research question itself allowed an integration of the data through joint display (Creswell & Creswell, 2018) to make for an easier discussion. As a result, the results from the UTAUT-TAM model (questionnaire part 1) where the top five resultant barrier variables were compared to the top barriers that middle income customers selected in the barrier instrument (questionnaire part 2).

It was noted that both these datasets are from the same sample of respondents but from different perspectives i.e., individually and collectively. This meant that for the UTAUT-TAM items, respondents answered on their perceived personal drivers and barrier variables to the use of mobile fintech. In contrast, the same respondents were questioned on adoption barriers, in a different qualitative way, on behalf of other customers like themselves. The resultant data is compared in a dual display (Table 5.2) between the barrier UTAUT scale outcomes and qualitative barrier variables. This method was pursued in order to further explain customer adoption for the middle income market in South Africa.

Table 5.2: Comparative Analysis of Mixed Part 1 and Part 2

	Ranked Top Barriers (UTAUT-TAM Results)	Ranked Top Barriers (Barrier Findings)		Comparison
1	**Self-Efficacy**	**Privacy Risk**	**BA7:** Lack of privacy of personal information on mobile fintech applications	Both of the top barrier findings and results were dissimilar. Respondents selected Privacy Risk as a barrier, however Self-Efficacy proved to have negative barrier relationship to adoption.
2	**Hedonic Performance Expectancy**	**Facilitating conditions**	**BA4:** Lack of internet connection and/or smart phones to use mobile fintech applications.	The findings and results for the barriers in second place were in contrast. Respondents selected Facilitating Conditions as a barrier, however Hedonic Performance Expectancy was proven to have a negative barrier relationship to adoption.
3	**Facilitating Conditions**	**Self-Efficacy**	**BA2:** Lack of user knowledge about mobile fintech applications.	The findings and results for the barrier factors in third place were dissimilar. Respondents selected Self-Efficacy as a barrier to intention, however Facilitating Conditions proved to have negative barrier relationship to adoption.

5.4.1 *Discussion of Mixed Results (Part 1) and Findings (Part 2)*

The comparison between the barrier results (Part 1) and barrier findings (Part 2) proved to be divergent in terms of priority ranking. Despite this observation, the presence of common barriers is significant. Namely, the common barriers were Self-Efficacy (SELF) and Facilitating Conditions (FC) which enforced their high importance as barriers to the customer adoption of mobile fintech.

According to Venkatesh et al. (2003) FC was found to be a predictor of BI in their quantitative UTAUT study. Similarly, the qualitative study from Alshehri (2012) also found FC to be a “very important” barrier to the adoption of e-government

technology. Factors that informed the FC result for Alshehri (2012) was a lack of technical support on the digital platform, and thus proved to be an adoption barrier for customers.

Comparatively, the FC item in this study's qualitative barrier part was described to respondents in terms of whether customers have internet / data connection or smart phones to enable their adoption of mobile fintech. Therefore, the high significance of FC from both datasets, according to this provided description, demonstrated a possible price sensitivity within middle income customers having to buy assets like a mobile phone or buy data for internet connection.

Since 55% of South African consumers own smart phones capable of downloading applications (C. Smith, 2019), it could be assumed that middle income customers can afford smart phones beyond basic functionalities. Literature showed that smart phone penetration is high in the country, however mobile application use or ICT adoption is low (Chigada & Hirschfelder, 2017). So, in spite of customer access and ownership of the necessary smart mobile phones, they might not have the Wi-Fi and data required to sustain connection. Overcoming this barrier implied that mobile fintech businesses should possibly create mobile applications that require low data bandwidth or even zero-rate them to stimulate adoption in this customer segment.

Self-efficacy (SELF) was the second barrier factor that emerged as a common variable in the mixed comparison analysis. When FC and SELF variables were compared within the same UTAUT-TAM Part 1 results; FC did not feature as a significant barrier variable, yet SELF was found to be a significant barrier. The significance of SELF was found to be negative and thus the strongest barrier to customer adoption. Therefore, SELF's re-emergence in the Part 2 barrier findings further drives the importance of a customer's belief about their own capabilities and knowledge to use mobile fintech.

Literature according to Walton and Johnston (2018) argued that the complexity of mobile fintechs such as crypto-trading or cryptocurrency is a barrier to customer adoption in South Africa. Such literature strongly resonated with the SELF factor emerging as a common barrier in this study, because it linked to the

perceived difficulty or application know-how that certain mobile fintechs appear to require from resistant middle income customers in South Africa. This implied a key need for education and a de-mystification process for customers to overcome the SELF barrier and unlock the adoption of mobile fintech.

This discussion aided the answer to research question 2 by comparing the barrier variables between the qualitative and quantitative datasets. This comparison demonstrated divergent barriers when ranked in terms of ranking, however common barriers of Self-efficacy (SELF) and Facilitating Conditions (FC) were found between the two datasets and discussed accordingly.

5.5 Research Question 3 Discussion

RQ3: *What factors influence the customer adoption of mobile fintech in the middle income market?*

In covering research question three and research objective one, this study was interested to examine the barriers and facilitators to customer adoption of mobile fintech in the middle income market. Through the semi-structured interviews (found in Instrument Part 4), subject matter experts were prompted to expand on their answers related to the barriers and facilitators as well other items related to digitally transforming customer behaviour. This semi-structured approach allowed for emergent factors, that intersect or lie outside of the variables already examined by this study's UTAUT-TAM and barrier outcomes, to arise out of these interview findings.

As such, four main themes were identified: external enablement, inclusive marketing innovation, consumer needs and digital ecosystem. Three sub-themes around this study's main unit of analysis of customer adoption were also identified: trust, digital behaviour, and product value. The purpose of this section enriches the discussion by linking relevant literature to the found factors that influence customer adoption.

5.5.1 *Theme 1: External Enablement*

I. *External Enablement: Middle Income Level*

Findings showed that smart phone penetration and the type of smart phone customers have determines their access and enablement to engage with mobile fintech applications. Interview participants highlighted the role of smart phones as a “gateway” and enabler to customer adoption of mobile fintech in South Africa. However, research on the level of smart phone penetration for the middle income market specifically was scarce and many provided general country facts. What was known to this study was that 55% of South Africans own the type of smart phone that can download mobile applications (C. Smith, 2019). And as the literature review proposed, many middle income customers likely form part of this group.

Despite the uncertainty on how many middle income customers have the appropriate smart phone, the findings established that customer income levels impact their purchasing power to enable purchasing such assets. As such, some participants impressed the need to distinguish between upper middle income and lower middle income customers as this prescribes their enablement to purchase the appropriate smart phone and consequentially adopt mobile fintech applications.

Another found dimension to external enablement were mobile usage patterns that emanate post purchasing a smart phone. Therefore, owning the appropriate smart phone is one dimension but usage is another dimension which requires more enablement. According to Chigada and Hirschfelder (2017), smart phone ownership is high in South Africa without matching ICT adoption. This means that mobile application use is limited, particularly as it pertains to financial applications like mobile banking which stood at 15% in 2017 (Chigada & Hirschfelder, 2017).

Quotes from interview participants corroborated this literature where it was observed with adopted retail cryptocurrency customers who would not log into their mobile fintech app for months at a time. Despite uncertainty on the reasons behind a lack of financial mobile application usage from both the literature and this study’s finding - it was clear that a combination of inter-related enablers are

required to work together to not only enable access to mobile fintech, but other enablers are necessary to see continued adoption for this customer segment. Other found external enablers for mobile fintech adoption that were also socio-economically related include financial literacy and previous mobile banking experience.

An example from the literature on the lack of ICT adoption that could fill in the gaps on what external enablers, besides smart phone ownership, are necessary for customer adoption is from Nanziri and Leibbrandt (2018) and Aguidissou et al. (2017). They found a lack of financial competency and a risk aversion to loss as some of the reasons behind a lack of continued online banking adoption in South Africa (Nanziri & Leibbrandt, 2018).

A similar customer pattern is observed in mobile banking where the majority of South Africans own bank accounts (Deloitte, 2019) however their internet banking usage is limited to checking account balances, account-transfers and third-party payments (Aguidissou et al., 2017). These examples of financial customer behaviour demonstrated the external enablement barriers that the traditional banks have not yet been able to overcome. This study's findings similarly showed that non-bank mobile fintech companies are observing similar adoption barriers for middle income customers, who casually engage mobile fintech without exploring more advanced products, or making bigger cryptocurrency investments that are over R 10 as one participant shared.

II. *External Enablement: External Customer Needs*

The external enablement theme also included external customer needs, as presented in Chapter 4. These needs were also found to be adoption drivers for middle income customers that are highly influenced by appearances and external forces like social networks. According to Bick et al. (2020) some customer adoption facilitators are related to brand association and brand familiarity, particularly for fintechs aiming to target culturally diverse customers that have diverse psychographic characteristics as exemplified in the South African middle income market. In essence, who and what a mobile fintech brand is associated with inside the customers mind could drive customer uptake in this market.

The literature thus confirms the finding that argue that middle income market customers will “pay over the odds for a nice phone” (Participant A1). This speaks to a kind of customer that perceives a nice phone as a must-have item associated with a certain kind of social status. Such examples are of brands that have successfully associated their products with what potential customers perceive to be ‘necessary’ in their lives. Similarly, mobile fintechs could drive customer adoption for this market through firstly conducting evidence-based assessments of customer needs and wants (Buckley & Webster, 2016). And secondly through the use of influencer marketing on social media platforms (Bick et al., 2020) mobile fintechs could upgrade their online brand equity and simultaneously satisfy external customer needs.

5.5.2 *Theme 2: Inclusive Marketing Innovation (IMI)*

I. *IMI: Diverse Customer Marketing*

According to Bosson et al. (2016) fintechs in African economies should recognise the cultural heterogeneity in their customer markets and adapt their marketing strategies accordingly. If mobile fintech products and services are not designed with intra-cultural nuances in mind (Bosson et al., 2016), then this could impede customer adoption. This rang particularly true for South Africa’s diverse market that has multiple languages and cultures.

Findings demonstrated a lack of marketing inclusion for low to middle income market customers who have diverse cultures and income levels. Interview participants highlighted one type of high-income customer that generally seems to be catered for by South African mobile fintechs. Therefore, localisation is required to curb non-inclusive marketing and product innovation.

Non-inclusive product innovations and marketing creates missed opportunities to capture cultural nuances (Buckley & Webster, 2016) like ethnic or language diversity within a customer segment and can evidently impede the customer adoption of mobile fintech.

Another aspect of innovation required on the part of mobile fintechs involves innovative pricing to create greater accessibility (Bick et al., 2020) for low to

middle income markets in South Africa. Due to the transient and unstable nature of the middle income market where many at the lower middle income level are at risk to falling into poverty (Zizzamia et al., 2016), it became imperative to use innovative pricing to drive the adoption of mobile fintech products and services. Interview findings confirmed the need for such pricing initiatives due to the current economic circumstances in South Africa where many middle income customers have become price sensitive. To further curb a lack of customer adoption because of such price sensitive customers, innovative products and pricing strategies were proposed to be adaptable to the diverse income levels that exist within this customer segment.

II. *IMI: Inclusive Product Design*

As per Dam and Siang (2020), customer-centric design thinking enhances product innovation. Interview findings are in line with this perspective from literature as local mobile fintechs were found not to place the customers at the centre of their product designs. As opposed to purely focusing on what product features to add or remove, mobile fintechs should empathize with middle income customers by designing products according to what their financial 'pain points' are and thus tailor a customer journey for them (Buckley & Webster, 2016). This strategy could guide innovation and marketing to be more inclusive and personalised.

III. *Inclusive Internal Practices*

Findings also demonstrated a need for inclusive practices within the local mobile fintech companies themselves, in terms of the entrepreneurs who establish them. The participant working at a regulator commented that there was a lack of culturally organic fintech products because of the lack of diverse fintech entrepreneurs in South Africa. Hence some local fintech products were being duplicated from global markets.

Literature on the typical fintech founder in global markets, showed a similar stereotypical pattern where the developers of global fintech solutions were "living a tech-savvy, metropolitan existence with an above average income" (Buckley & Webster, 2016, p. 8). Although this example cannot wholly be extended to South

African fintech entrepreneurs - it was noted that local literature showed that there are many barriers to entry in starting a fintech. As a result, many local fintech entrepreneurs are self-funded in the first 2 to 3 years of operating (Genesis Analytics, 2019) thereby producing a lack of diverse entrepreneurs as reported by the interview participant.

Overall, the inclusive marketing innovation theme includes two main considerations required from mobile fintech companies to drive customer adoption in the middle income market. Firstly, was the need to design and market localised products that are customer-centric and inclusive for a diverse customer segment. The diversity of middle incomes customers results from the diverse cultures present, thus empathy with their perceptions and financial experiences could unlock customer adoption. Secondly, it was discussed that this customer segment exhibited a price sensitivity due to the diverse income levels inside the segment. Mobile fintechs could address this through pricing innovations. Lastly, findings suggested that diverse fintech entrepreneurs are needed in South Africa to truly create and design the required inclusive innovations. Various literature was used to discuss these findings.

5.5.3 *Theme 3: Customer Needs*

The findings revealed that customer needs such as payments and lending are primary financial needs, hence their high customer adoption in the middle income market compared to other mobile fintech segments. Secondly, latent customer needs that follow their primary and secondary needs were factors such as the perceived ease of use, speed, and convenience which significantly contributed to customers adopting a certain type of mobile fintech.

I. *Customer Needs: Financial Needs*

Previous studies in other emerging markets such as Kenya demonstrated payments as the primary everyday need hence the resultant high customer adoption of over 70% of Kenyans utilizing the mobile money service (Natile, 2020). The centrality of the payment need is also exemplified in the fact that 44%

of adults from developing countries had made a digital payment in 2018 (Yermack, 2018).

Moreover, the literature states that Kenya's viral mobile payment success, M-pesa was largely due to it embedding itself into the payment practices that consumers were already doing prior to the introduction of the mobile payment system (Morawczynski, 2011). By fitting itself into the customer need of paying someone or getting paid, it thereby satisfied a primary customer need.

Consequentially, findings also highlighted why lending would be the next fintech segment to see adoption, after payments, which was due to its fulfilment of another primary customer need which is the need to borrow. This is evidenced by the lending fintech segment accounting for 12% of fintech segments, which follows after payments at 30% (Genesis Analytics, 2019) as the two leading B2C segments in South Africa.

Further literary evidence for lending as the next customer need, was exemplified in Kenya's M-Kopa (translation is "to borrow" in Swahili) which offers solar products, phones, loans and micro-credit products that customers can repay for on the same mobile money infrastructure of M-Pesa (Natile, 2020). It was a product evolution that began with payments and continued with lending next; thus demonstrating the relationship between payments and lending experiencing high customer adoption first. Interview findings also suggested that such product evolutions in Kenya and South Africa were based on their fulfilment of primary customer needs being met first (payments and lending). As such, the secondary customer needs of savings or insurance expectedly experience customer adoption after payments and lending. The findings showed that the customer adoption of these mobile fintech products were replicated in the priority order of customer needs.

II. *Customer Needs: Latent Customer Needs*

Latent customer needs also proved to impact the customer adoption of mobile fintech in the middle income market. The findings proposed that these latent needs included efficiency, convenience and speed which are usually satisfied through a mobile fintechs service delivery or via product fulfilment. Literature

confirmed this finding with the case study of China where customers perceived ease of use of mobile fintech was a significant contributor to their high adoption rate of 95% (EYGM Limited, 2019). Furthermore, the rising adoption of peer to peer (P2P) lending services in China was largely attributed to how easily accessible and convenient the platforms were (Arner et al., 2015).

5.5.4 *Theme 4: Digital Ecosystem*

The findings revealed the need for a digital ecosystem in South Africa's financial services sector in terms of fostering collaborations at an industry level, to accommodate and facilitate the digitally transforming behaviours taking place a customer level. In essence, the digital ecosystem could be understood as a meta-enablement initiative aimed to better enable customer adoption in the middle income market.

i. *Digital Ecosystem: Covid-19*

All interview participants raised the positive changes witnessed in middle income customer behaviour and other customer segments, because of the Covid-19 pandemic and lockdown restrictions. Specifically with regards to the middle income market, findings showed how the shift from offline to digital channels had forcibly onboarded customers to adopt more mobile fintech products and thus moved parts of their financial lives into a digital ecosystem.

- *Covid-19: Increased customer adoption*

Two participant examples of the said risen uptake was found, firstly in insurtech where Covid-19's impact saw the insurtech adoption curve cut by three years. Secondly was another's participant's experience of seeing an astronomical uptake of 100 000 additional customers creating mobile app profiles on a cryptocurrency platform since the beginning of the South Africa's lockdown in early 2020. Such customer behavioural changes provided insight into a developing digital ecosystem where a significant amount of middle income customers could now be onboarded customers into using mobile fintech applications other than mobile banking applications only.

Literature was in sync with this finding as the downloads of mobile fintech applications has increased in global markets since the Covid-19 pandemic began in early 2020 (Fu & Mishra, 2020). In comparison, the customer adoption patterns for the South African market during lockdown were still being observed and researched as the pandemics impact is still ongoing. Nonetheless, available research also suggested that the local customer markets interest in cryptocurrency fintech specifically, pre-dates the pandemic. Customer interest was best exemplified in a global online search statistic showing that cryptocurrencies, specifically the word 'bitcoin' was most searched from South Africa according to Google Trends in 2018 already (Gogo, 2018). This exemplified that the pandemic piqued a pre-existing curiosity for cryptocurrency fintech amongst South African consumers. Furthermore, the country-wide restrictions influenced them to take the step from intention into adoption.

However, a dissimilar finding from this study's findings showed a lack of customer engagement post-adoption - particularly in the case of mass retail cryptocurrency customers. Literature advised that the issue of customer non-engagement is argued to change through social influences and changing consumer attitudes (Mazambani & Mutambara, 2019), particularly in the South African context. Another suggestion from Mazambani and Mutambara (2019) to stimulate continued adoption was for customers to be allowed to utilize cryptocurrency platforms in groups. This is a poignant suggestion which aligns to this study's previous argument in the literature review; regarding the digital transformation concept of 'network effects'. The literature showed that network effects are a plausible adoption stimulant within with peer-to-peer (P2P) innovations (Parker & Van Alstyne, 2005) and cryptocurrency platforms could benefit from such innovations existing in a digital ecosystem.

Therefore, network effects could move casual customers into continued adoption through engaging within a digital ecosystem set-up. Due to current regulatory restrictions, the realisation of a digital ecosystem approach might initially only apply to each mobile fintech company, such as cryptocurrency fintechs, creating their own systems and partnerships to enable a level of P2P customer engagement.

In summary, the Covid-19 pandemic accelerated the uptake of mobile fintech applications for South African consumers at large, including the middle income market. The interview findings showed that the cryptocurrency and insurtech fintech segments in particular saw a dramatic turnaround in the customer adoption of their products. Literature confirmed how the heightened uptake in South Africa was replicated in global markets. However, the study also noted the limited continued adoption observed by interview participants, and this discussion demonstrated the ways literature advises for the stimulation of continued customer adoption.

- *Covid-19: Disrupted Cash-Based Economy*

Despite the global lockdown restrictions, Al nawayseh (2020) believes that developing countries with high consumer cash use were of particular danger of mass Covid-19 transmission. South Africa's case was no different where consumers were known in the pre-Covid-19 period to have high rates of cash use, with 80% of all transactions recorded to be done in cash (Deloitte, 2019). Nonetheless, there has been a noticeable change as findings demonstrated a minor shift away from cash across all the interview responses. However, it was apparent that cash is still a preferred method of payment for many middle income market customers. The prevalent cash use in South Africa was in contrast to global literature where a more massive increase in digital payments was observed due to the impact of Covid-19 (Natarajan, 2020).

Although the lessened use of cash within the middle income market was a minor disruption to the cash-based economy, the witnessed change to digital payment solutions is still a progressive move towards customers onboarding into a digital ecosystem. The payment switch to digital, albeit minor, could be the necessary platform on which other local mobile fintechs could use for customers to adopt more fintech products. Similar to the ecosystem approach exemplified between M-pesa and M-Kopa; where the M-Kopa used M-Pesa's infrastructural and customer foundation to provide a platform on which to introduce its credit offerings and other mobile centered products (Natile, 2020).

ii. *Digital Ecosystem: Collaborations*

According to Boratyńska (2019), both fintechs and banks in global markets share the same customers and thus begged the question of how these two entities could relate non-competitively in the ecosystem of the future. This digital ecosystem was proposed in the interview findings as a proactive approach between incumbent, non-bank fintechs and other players to accelerate customer adoption in the middle income market and other South African customer segments at large.

- *Collaborations: Incumbent Banks form part of fintech ecosystem*

Findings demonstrated that defining non-bank fintechs and traditional banks as enemies or competitors was futile, hence the ecosystem approach was advised. A digital ecosystem was proposed to secure the original promise value of fintech that is to meet latent customer needs of “convenience, simplicity, speed, security, affordability” (Mungai & Bayat, 2018, p. 226). This value could then be combined with the strength of incumbent banks which is to provide customers, such as middle income customers, with the surety they get from the long-standing credibility of incumbent banks.

Trends in global banking literature confirmed this finding as the digital ecosystem approach is widely being adopted (Boratyńska, 2019), and therefore relevant for the South African context.

The prevalent findings also suggested that due to the current lack of a digital ecosystem in the financial services industry, mobile fintech companies are often rivalled against the incumbent banks however this is an obscure view for the South African context. Especially since the incumbents also have a digital banking presence, this meant that they in essence have their own ecosystems with their own suite of products and services in one central location for customers.

Another participant confirmed that the incumbents locked-in ecosystem approach by recalling an instance where it is not possible to conduct any banking transaction without the corresponding mobile application for authentication or approval processes. This is one of the strategies of a closed ecosystem that

creates a “lock-in effect” (Dapp, 2014, p. 9). Thus a more open digital ecosystem was advised for collaborations between diverse industry entities to work, that typically includes 5 key players i.e. fintech start-ups, government, customers, developers and traditional financial institutions like the banks (Lee & Shin, 2018).

- *Collaborations: The extent of digital transformation in South African financial services*

Interview findings pointed out how local incumbent banks in South Africa were early adopters to digital innovations and were seen as leading the local fintech market. Therefore, perceiving non-banks fintechs and banks in a broader financial services sense would assist to remove the competitive labels between these two players - for the sake of both increased customer adoption and accommodating digitally transforming customer behaviour. In this way, this study found the digital ecosystem with multiple stakeholder interaction (Coetzee, 2018) an approach that would allow each entity to play to each other’s strengths without compromising their independence. Although there is less incentive for banks to collaborate with non-bank fintech players and others, due to their already extensive use of digital channels and high customer adoption. Despite this, for incumbent banks to remain within a closed ecosystem might not be sustainable for serving a changing customer with evolving latent needs and increasingly digital behaviour.

Literature demonstrated that through the investment of large scale digital transformation and prioritized digitalisation in recent years, (Camarate & Brinckmann, 2017) the local incumbent banks have a highly sophisticated infrastructure that is dissimilar to other emerging markets. Moreover, the banking customer market share has remained large with 80% of the South African population being banked (Deloitte, 2019). Therefore, the recorded 19% of South African mobile money customers in 2017 pales in comparison (Mungai & Bayat, 2018) to the growth of banked customers.

In contrast to the literature is insight from the findings which revealed that countries with high banking penetrations like South Africa’s don’t usually see the same mass scale customer adoption of fintechs like mobile money. Mass scale

customer adoption for mobile money adoption was the case with M-Pesa that had a 70% adoption rate (Natile, 2020) in Kenya, which also had a low banking penetration. M-pesa's growth was incomparable to South Africa's context due to South Africa's long-standing high banking penetration prior to the introduction of fintechs such as M-pesa. Granted more recent customer data from a variety of fintech segments was required to better understand current adoption rates of mobile fintech versus current banking adoption in South Africa.

More so because this study's interview findings also showed a considerable customer adoption shift in the middle income market, from a previously slow uptake to a growing adoption of mobile fintech solutions. Nonetheless the study noted South Africa's strong banking history as a possible reason for the currently slow customer adoption compared to other emerging markets like in Kenya.

Findings also noted that the digital ecosystem approach would test the extent of digital transformation for both players. On the one hand, it would test the digital readiness of non-bank fintech companies to create their own individual ecosystems since many are still start-ups (Genesis Analytics, 2019) and in their first decade of operation. On the other hand, this ecosystem approach would test if the manual operations still feature in the back-office of incumbent banks (Chironga et al., 2018) where literature showed how they are not as digitally ready as their front offices and client facing services. Therefore, to adequately meet rising consumer demands and through continuous improvement of their financial products and services (Dapp, 2014), it was argued that both players would need one another in a digital ecosystem for South Africa's market.

- *Collaborations: Changing financial services landscape*

Literature demonstrated that disintermediation and disruption to the banking sectors core business could take place at many angles, and not only with fintechs. With the emergence of fluid companies (Rogers, 2016), in addition to the presence of fintechs, threatens the current banking stronghold in South Africa. Examples included, TMT companies (technology, media, and telecommunications) like MTN offering insurance and mobile money products (McLeod, 2020), or grocery retailers like Shoprite offering remittance channels

(Dagada & Townsend, 2012). Camarate and Brinckmann (2017) project these companies and more would evolve into providing more advanced financial services type products. For example, a property firm like Growthpoint could evolve to offer property finance or a taxi association like SA Taxi offering vehicle finance to its taxi owner clientele (Camarate & Brinckmann, 2017).

Therefore, it was noted that many of such future disintermediation projections are primarily based on non-financial services companies optimising the use of their pre-existing customer profile data (Dapp, 2014) to create new products and services and personalise customer experiences. The interview findings gave an example of this new era of fluid companies; where lending-based fintechs are using alternative customer data to conduct credit risk assessments and thus tailor their products. In comparison, the literature depicted South African banks as lagging in this area, especially within lending. Only 12% of South African customers managed to acquire credit from a financial institution in 2014 (Mungai & Bayat, 2018). Furthermore, banks have not fully unlocked the potential of big data for such purposes (Mungai & Bayat, 2018). The failures of South Africa's incumbent banks to seize the lending opportunity differed greatly to Kenya where 300 000 customers apply for a small loan per day via their mobile phones (Mungai & Bayat, 2018). Such high customer demand are the potential rewards of a digital ecosystem approach, particularly when geared as a mobile first initiative.

- *Collaborations: Ecosystem possibilities for South African financial services*

Despite the lack of a massive fintech disruption in the financial services sector, as seen in other emerging markets, local incumbent banks have recognised the need collaborate with non-bank fintechs to ensure sustainability in a changing financial sector landscape. According to PwC (2017), 63% of South African banks were recorded to already in partnerships with fintech businesses.

Moreover, 96% of the same group of incumbents anticipate more partnerships with fintechs by 2022 (PwC, 2017). These projected partnerships were in line with the interview findings where a participant confirmed vendor-like collaborations were likely to occur in the future of South African financial services. In this way, multiple fintech solutions could be housed inside the bank's infrastructure.

One practical example from literature to realise this future; were for banking entities to accelerate the delivery of new products and services by outsourcing their research and development to fintechs (PwC, 2017). Fintechs could in turn utilize the banks large pool of customer data (PwC, 2017) for valuable use.

Another example to realise the digital ecosystem locally was for a segment by segment ecosystem. This is due to current restrictive regulatory frameworks in South Africa, where a wider digital ecosystem including diverse players requires more flexible regulations and policy like in global markets. Local literature thus suggested for a segment specific approach like in a proposed payment ecosystem by the South African Reserve Bank Vision 2025 (Deloitte, 2019). It is an open approach that would allow interoperable standards across different payment mobile applications and distribution systems (Deloitte, 2019) and thus avoid locking consumers in.

5.5.5 *Sub-Themes: Trust, Digital Behaviour, Product Value*

The identified sub-themes of Trust, Digital Behaviours and Product Value revolve around the 'adopted customer' concept that this study created to explain the factors that influence customers to adopt mobile fintech into their digital behaviour (see Figure 4.4). Trust and digital behaviours were customer centric markers that might be exhibited by a digitally adopted customer. Then, product value would be what the adopted customer would recognise as valuable in the mobile fintech. Each sub-theme is discussed below.

I. *Sub-Theme 1 discussion: Trust*

The interview findings demonstrated conflicting opinions on whether South African middle income customers have trust or not for mobile fintechs. Some participants believed this customer segment has low trust and are sceptical of mobile fintech due to their unfamiliarity. Comparatively, other participants argued this customer segment is predominantly characterised by digital natives therefore they instinctively have high trust for digital products and services such as mobile fintech.

According to Sigurdsson et al. (2015), for online financial or banking related products, privacy assurances in the form of pop-ups become important to building customer trust. Examples of well-designed customer experiences (CX) is by allowing customers to read through the terms and conditions, as an example of possibly creating trust in a digital environment. This possibility was confirmed by a participant from insurtech where decision-making predominantly takes place online for their customers. It was suggested that these types of assurances are more likely necessary for Digital Immigrants as opposed to Digital Natives.

Participants also voiced the opinion that Digital Natives exemplify higher levels of trust with digital products and services. Therefore, the following insight was drawn in that the longer the period a customer had engaged with the digital world – as is the case with digital natives, influenced how much trust that customer is likely to give digital products like mobile fintech.

In summary, trust can be a barrier for Digital Immigrants, and it can also be a facilitator for Digital Natives. Due to the complexity of the middle income customer segment with different propensities for digital tools, transforming both these digital profiles into adopted customers with high trust would require different customer journeys to reach there. For digital immigrants, as previously indicated in this study, trust could be gained through a hybrid form of customer experiences combining offline and digital channels of engaging this customer. For digital natives, the ease of use with the digital technology would likely provide great potential for increased customer adoption of multiple mobile fintechs.

II. *Sub-Theme 2 discussion: Digital Behaviour*

The findings exemplified the digital behaviour of an adopted customer who is also a middle income customer, as an individual who meets a variety of personal needs digitally. This extended beyond meeting financially related needs e.g., payments or lending but also fulfilling other needs through social media and retail e-commerce etc.

The findings further expressed that the more integrated a middle income customers' life is with digital technologies, then the higher the likelihood of them adopting mobile fintech. Interview findings categorised this type of customer as

more of a digital native than a digital immigrant. Literature confirmed that digital natives were disproportionately targeted by mobile fintech businesses in South Africa (Lourie, 2020) due to similar perceptions. Moreover, the interview findings partially confirmed that there was a higher likelihood of the average mobile fintech customer in the middle income market to be a digital native.

As per the conceptual model which was derived from the interview findings, it was noted that the digital behaviour sub-theme was related to the digital economy theme. Therefore, whether the adopted middle income customer was a digital immigrant and digital native was irrelevant as both profiles could exhibit high digital behaviour if within the correct circumstances.

In summary, digital behaviour was found to be a sub-theme centered on middle income customers familiarity with the digital world to be able to behave and interact fluidly with mobile fintech applications. As such, this behaviour was identified by interview findings as typically found from either digital immigrants or digital natives.

III. *Sub-Theme 3 discussion: Product Value*

The findings demonstrated product value as the only sub-theme factor that came from outside of the customer, as product value needs to be proved by the mobile fintech application itself. As a result, product value could eventually be recognised by the customer. This recognition was found to be validated by social influence and platform network effects.

Literature showed that product value in the digital economy is increasingly becoming relational where two-sided interactions are occurring between businesses and customers or sometimes multi-sided interaction - like in an ecosystem (Parker & Van Alstyne, 2005). Should mobile fintech businesses adopt such ecosystem approaches or allow P2P interactions then literature showed that this would positively impact customers perceived product value of mobile fintech (Parker & Van Alstyne, 2005). Therefore, the more customers who digitally interact with one another the more network effects (Parker & Van Alstyne, 2005) created to possibly propel the adoption curve of mobile fintech.

What this demonstrated was that product value is essentially predicated on social influence; where if one customer was aware of the product value of a mobile fintech then a domino effect was probable via network effects. Bick et al. (2020) further underscored such literature by advising for product value to be created from the 'bottom-up' (i.e., begin with the customer) as opposed to a top-down approach. In summary, awareness and education of mobile fintech's product value could be validated through more aware and educated customers influencing others to adopt (social influence).

Interview findings also confirmed this by suggesting how low customer awareness, particularly in the cryptocurrency segment, was an obstacle to customer adoption of mobile fintech. Participants voiced their observations on how a lack of recognising the product value and the benefits of mobile fintech was related to a lack of customer awareness in the middle income market. So benefits such as cost savings or investment returns remain undervalued by unaware customers. Therefore, increasing product value is a necessary facilitator to driving customer adoption for this market. A solution, as suggested by the literature, is that customer awareness could be driven through people influencing other people to recognise the value and adopt mobile fintech.

It was deduced that customer mis-understandings on the 'why' or 'so what' factor behind a product becomes a serious barrier for middle income customers becoming fully adopted customers. Hence the implication was for mobile fintech businesses to drive adoption through the vehicle of customer awareness, and eventually the mobile fintech product would scale because the customers would be driving adoption themselves.

5.6 Research Question 4 – Mixed Method Discussion

RQ4: *Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech services?*

The below discussion was based on the four open-ended questions asked from the questionnaire respondents. The purpose of this discussion was to answer research question 4 and fulfil research objective 2 which sought to explore the relationship between digitally transformed customer behaviour and the adoption of mobile fintech in the South African middle income market. The objective was fulfilled by having a mixed discussion between the content analysis findings from instrument Part 3, with Part 4's semi-structured interview findings. This mixed discussion was also related to relevant literature.

> *Open-ended Question 1: Have you used mobile fintech applications before? If yes, please name the application and detail your experience (Category: current fintech segment analysis)*

Part 3 Outcome: The findings showed that most respondents currently used mobile banking as their primary mobile fintech product and service. 'Not specified' products and 'mobile payments' were found to be second and third used applications respectively.

Integrating Part 4 Outcome: Although this finding was not consistent with both literature and the traditional definitions for non-bank mobile fintech offerings, it was understandable for this customer market. Since 80% of the South African population is banked (Deloitte, 2019) and the incumbent banks have successfully incorporated mobile-centred and digital channels into their customer services, it was not surprising that customers would conflate the now digitalised banking services as mobile fintech as well. As a result, this study posited for the definition of mobile fintech for the South African customer market at large to expand and include traditional banks into the digital ecosystem - as per the findings in the Part 4's semi-structured interview discussion.

Moreover, the second mobile fintech segment used by this sample was ‘not specified’ which indicated a general misunderstanding and lack of awareness on what mobile fintech is and how it is differentiated from traditional mobile banking. Part 4 findings also demonstrated a customer lack of awareness and the need for product value recognition as a way to facilitate necessary customer adoption.

Lastly the result of ‘mobile payments’ accounting as the third segment that middle income customers have adopted and is consistent with recent literature. According to Genesis Analytics (2019) mobile payments is the most mature mobile fintech segment in South Africa and have thus had a longer time to develop into customers behaviours.

> *Open-ended Question 2: Which mobile fintech product do you want to use in the future, besides payments? Examples are insurance, lending, investments, online trading, cryptocurrency etc.? (Category: future fintech segment penetration analysis)*

Part 3 Outcome: The finding for this question was divided between the customer respondents who self-identified as Digital Natives and Digital Immigrant profiles. It was found that Digital Natives would like to use Insurtech (24%) the most, followed by Crypto-trading (21%) and Savings (21%). Comparatively, the majority of Digital Immigrants would like to adopt Crypto-trading (22%) first and ‘Other’ or undefined segments (20%) follow.

Integrating Part 4 Outcome: Since most respondents were Digital Immigrants, it was significant that this group would like to adopt crypto-trading the most. Walton and Johnston (2018) found contradictory evidence that showed that although bitcoin adoption had great potential in Sub-Saharan Africa, local customers lacked the knowledge to fully adopt and engage with it. Therefore, the customers desire to adopt cryptocurrencies may be present as this sample shows (22%) and serves as a prediction for future mobile fintech penetration, however the need for knowledge slows how near or far that future adoption is for middle income customers.

In addition, the same literature confirmed why the second largest fintech segment which Digital Immigrants stated as their desired mobile fintech to use next was 'other or undefined'. Such responses were indicative of the need of fintech education (Walton & Johnston, 2018) for middle income customers, particularly around the different types of mobile fintech like bitcoin payments and crypto-trading applications. Moreover, Part 4 findings suggested that the lack of product value recognition within middle income customers was related to customer unawareness of mobile fintech products. This lack of awareness distorted customers perceived self-efficacy and inevitably impedes the adoption of mobile fintech.

Comparatively, 'insurtech' emerged as the mobile fintech segment that most Digital Natives in the customer sample would like to adopt next. As customers with the greater assimilation into the digital world, it was arguably atypical for insurance products such as insurtech to be attractive to this customer segment when compared to lending or savings. This argument was supported by literature which demonstrates that lending and savings follow after payments as the fintech segment with the most maturity in South Africa (Genesis Analytics, 2019) and current customer adoption trends.

> *Open-ended* Question 3: *Do you conduct all your personal financial transactions digitally - either on a mobile app or online? (Category: digital behaviour analysis)*

Part 3 Outcome: 76% of respondents answered, 'Yes' and the main categories of 'Convenience' and 'Efficiency/Speed' emerged as common customer reasons for conducting all their transactions digitally. In contrast, 24% of respondents answered 'No' and the common comment were categorised as 'Need Human Contact' and 'Cash Economy Content'

Integrating Part 4 Outcome: An overwhelming majority of respondents at 76% only used mobile fintech applications to perform financial tasks and fulfil their financial needs. This majority finding was distributed across all the digital profiles and also included Digital Aliens and Digital Laggards as part of their digital

financial behaviour. In comparison, Part 4 findings attributed the impact of Covid-19 as an accelerator to the rapid onboarding of South Africans customers onto digital channels for various uses that include financial ones. This interview finding was consistent with global digital uptake rates due to the pandemic (Fu & Mishra, 2020) and proved its impact on the customer behaviour in sample respondents.

The most common comments on the reasons behind the preferred use of digital transactions was indicative of customers whose latent needs of “convenience, simplicity, speed, security, affordability” (Mungai & Bayat, 2018, p. 226) were increasingly important. As part 4 findings suggested, fulfilling these customer needs should be embedded into the value proposition of digital financial services such as mobile fintech.

The small 24% of part 3 respondents who preferred offline contact due to their engagement with the cash economy was a pointer to the practical socio-economic reality of South Africa. There are multiple pockets within the South African society that depend and only deal within the cash-based economy (Deloitte, 2019). This means that some transactions are possibly not for directly personal finance reasons, as many comments under the ‘Need Human Contact’ category were for informal worker payments such as domestic workers and gardeners that required cash only use.

> *Open-ended Question 4: Do you use mobile fintech applications for all your payment needs? If no, please select the amount of cash payments you make in a month. (Category: offline behaviour analysis)*

Part 3 Outcome: A majority of 61% of respondents conducted all their payments through a mobile fintech application. 39% of respondents selected that not all their payments were conducted through a mobile fintech application.

Integrating Part 4 Outcome: This question was related to Question 3 and provided insight into how many of the digital transactions that middle income customers perform are related to payments**.** Therefore, the answer was that 61% of their digital transactions are attributed payments. This finding proved the

extremely high significance of payments as a priority need that must first be met to enable increased customer adoption for this market. As per the discussion in Part 4 interview findings, payment customer needs emerged as a central need that influenced the success of the M-Pesa wallet in Kenya (Morawczynski, 2011) and other fintech segments consequently built on that payment fintech success (Natile, 2020). Similarly for the South African context where payments is already leading in both customer uptake and segment maturity (Genesis Analytics, 2019), the implication here for local mobile fintech businesses was to possibly build on the pre-existing payment foundation to introduce new mobile fintech products. These new products could live in a pre-existing ecosystem where customers, like middle income customers, are already familiar with payments to create an easier transition and thus increase the adoption of non-payment mobile fintech products.

5.7 Summary of Discussions

i. ***Research Question 1:***

What are the middle income market's adoption barriers and facilitators of mobile fintech?

The results from Instrument Part 1 showed three adoption facilitators of Attitude, Behavioural Intention and Utilitarian Performance Expectancy. Self-Efficacy was the only adoption barrier result. These four constructs made up this study's found customer adoption facilitators and barrier for the middle income market.

ii. ***Research Question 2:***

How do the qualitative findings further explain the customer adoption barriers of mobile fintech according to middle income market customers?

The findings from Instrument Part 2 showed that the qualitative findings were not significantly different to the quantitative results, because two common barrier variables of Self-Efficacy and Facilitating Conditions were found in both datasets. This commonality demonstrated a high correlation between the qualitative and quantitative findings in examining research objective 1. Therefore, the qualitative barrier findings further explained the quantitative results by deepening the study's perspective on how integral these adoption barriers were to overcome for middle income market customers.

iii. ***Research Question 3:***

What factors influence the customer adoption of mobile fintech in the middle income market?

The findings from instrument part 4 showed that emergent factors from this study's thematic analysis do indeed influence the barriers and facilitators of customer adoption. There were overlaps with the quantitative part 1 results in that the theme of Trust resurfaced as a sub-theme in the Part 4's interview findings.

Moreover, new emergent factors arose such as Inclusive Marketing Innovation, External Enablement, Customer Needs, Digital Ecosystem and the sub-themes of Digital Behaviour and Product Value.

The model created from the thematic analysis provided explanatory insight to how all these stated factors are inter-related in terms of being enabling relationships to customer adoption, as opposed to the causal pathways that are observed in the UTAUT-TAM model.

iv. ***Research Question 4:***

Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech services?

The findings from instrument part 3 demonstrated that middle income customers exhibited highly digital customer behaviour, as most respondents firstly self-identified themselves as Digital Immigrants or Digital Natives. Secondly, 76% of respondents used mobile fintechs for their personal financial transactions. Therefore, the answer to this question is yes - middle income customers with digitally transformed customer behaviour do adopt mobile fintech. In the same breath, due to the diverse income and cultural pockets within the middle income market, the found digitally transformed behaviour could not be applied as a fact to the entire market.

The study also noted another ungeneralisable factor for this customer market. The digital customer behaviour within middle income market customers showed their current use of mobile fintech to be extremely varied. Therefore, mobile fintech penetration for this market was varied. This was found to emanate from a lack of customer education or awareness on the different types of mobile fintech, as well as their majority adoption of mobile banking applications coming from traditional incumbent banks and not as much from non-bank mobile fintech.

The lack of customer education specifically provided nuance to this research question, as it demonstrated how the decentralized and unbundled nature of mobile fintechs make the link between digitally transformed customer behaviour and customer adoption for exactly which mobile fintech a challenge to succinctly

connect. Nonetheless, the willingness and intention to adopt non-bank mobile fintech in the future was clearly present in the sample respondents who desired to adopt non-bank mobile fintechs such as insurtech and cryptocurrencies. This proved that even if some pockets of middle income customers have not yet adopted a mobile fintech, they still exhibited digitally transformed customer behaviour through their engagement with traditional mobile banking and possibly other non-financial digital technologies or platforms.

In summary, it was deduced from the open-ended question findings that middle income market customers with digitally transformed customer behaviour do adopt mobile fintech - albeit a diverse range of mobile fintechs. In addition, middle income market customers were found from the interview findings to have diverse customer pockets with varying levels of digitally transformed customer behaviour due to their continued engagement with offline activities, or others having highly digital behaviour shown in e-commerce behaviour. Thus, digital transformed customer behaviour could not be wholly related to all middle income market customers.

CHAPTER 6. CONCLUSION

6.1 Principal Findings

The principal findings for this study are presented in this chapter according to the theoretical frameworks and research questions, which was done prior to presenting the recommendations, methodological contribution and limitations. The chapter concludes with future research suggestions.

Through a mixed methodology, involving a questionnaire to middle income market customers and semi-structured interviews with mobile fintech experts, the study fulfilled its objectives by expanding customer insights for this unique South African market.

This study utilized two theoretical frameworks to inform its theoretical base and overall conceptualisation. Firstly, the conceptual framework (Figure 2.2), as developed by Kane et al. (2019), was used to zone into the customer adoption phase that is part of the greater digital transformation (DT) programme. Since the scope of this study ends with customer adoption, it could not account for the next phases where adaptation and assimilation follow. Adoption, in this DT framework, was not a measured concept which demonstrated low, medium or highly adopted customers. Instead, the adoption of mobile fintech was used as an indicator of which customers are on the DT journey.

And as this study showed, middle income customers are adopting various digital technologies and thus on the DT journey. However, not all the pockets of middle income market customers have adopted or are continually adopting a form of mobile fintech into their digital behaviour. This finding did not prove that the relationship between the customer adoption of mobile fintech and DT customer behaviour was untrue. What it proved was that the phases of the entire DT programme, as conceptualised by Kane et al. (2019), are not dependent on one available digital technology or a particular kind of mobile fintech for DT to progress. Many other digital technologies and the increased customer adoption of multiple mobile fintechs could provide the required progression in DT.

Secondly, the organising framework (Figure 2.3), depicted this study's two research objectives. This framework was not a theory to be tested per se and served instead as a high-level display of the research objectives and how they could be met. Research objective 1 was met through the UTAUT-TAM technology acceptance model where the proposed barriers and facilitators were adequately examined. The models facilitator outcomes of ATT, BI and UPE-DIGIP-BI were found to positively impact research objective 2. Therefore, the relationship between digitally transformed customer behaviour and customer adoption mobile fintech was confirmed.

However, this relationship was found not to be consistently true for the entire customer base in the middle income market as many customers had diverse answers and understandings of mobile fintech products. The ungeneralisable findings from the qualitative customer data proved the need for customer education on the different types of mobile fintech products and services. In addition, the low sense of self-efficacy from the quantitative results showed a negative impact it had on customers digitalising journey of digital transformation under research objective 2. These two negative factors demonstrated the ways in which digitally transformed customer behaviour could be deaccelerated, and also how meeting the second objective of digitally transformed customer behaviour required a greater number of significant facilitating constructs than the three facilitator constructs found in this study.

6.1.1 *Conclusions for Research Question 1*

RQ1: What are the middle income market's adoption barriers and facilitators of mobile fintech?

- The results showed that out of 10 independent variables in the modified UTAUT-TAM model, only 3 independent variables were significant predictors and thus facilitators for the customer adoption of mobile fintech in the South African middle income market. These were Attitude (ATT), Self-Efficacy (SELF) and Utilitarian Performance Expectancy (UPE). Both ATT and SELF were direct facilitators to customer adoption and demonstrated the significance of attitudinal and psychological constructs that customers hold

internally about mobile fintech - as opposed to externally based constructs like Facilitating Conditions.

- The third independent variable to emerge as a significant facilitator to customer adoption was UPE. Although UPE initially did not impact Behavioural Intention (BI), it became significant when moderated with customer Digital Profiles (DIGIP). This finding revealed how a customer's higher propensity to digital technologies facilitates their adoption of mobile fintech.
- The dependent variable of BI was also a facilitator of customer adoption, as it was found to have a significant causal relationship to customer usage of mobile fintech.
- Results also demonstrated that customer middle income level i.e., whether in the lower or high bound, were not greatly significant on the customer adoption of mobile fintech.

6.1.2 *Conclusions for Research Question 2*

RQ2: How do the qualitative findings further explain the customer adoption barriers of mobile fintech, as measured quantitatively, according to middle income market customers?

Through a mixed discussion, the findings here demonstrated two key barriers that were common between both the qualitative and quantitative datasets. The barriers were Self-Efficacy (SELF) and Facilitating Conditions (FC). Although FC was not a statistically significant barrier, it was the third UTAUT-TAM model construct to be ranked as having a negative relationship with BI. This commonality finding helped explain these two constructs more descriptively, and add further insight into how middle income customers firstly still battle with facilitating conditions such as having a price sensitivity, although they possess purchasing power. Secondly, the importance of self-perception and the internal capabilities in SELF was emphasised as a barrier to customers adopting mobile fintech.

6.1.3 *Conclusions for Research Question 3*

RQ3: What factors influence the customer adoption of mobile fintech in the middle income market?

The themes derived from the semi-structured interviews were found to be inter-related factors i.e., External Enablement, Customer Needs, Inclusive Marketing Innovation and Digital Ecosystem. These four main themes revolved around the ideal 'adopted customer' conceived by this study for the middle income market. The adopted customer was found to have the following 'traits' which were the sub-themes of Digital Behaviour, Trust and recognising Product Value. All seven factors were found by this study to greatly influence the customer adoption of mobile fintech in the South African middle income market. Each factor emerged from the analysis as either a negative or positive influencer, thus here are some of the key findings related to this dynamic:

I. Theme 1: External Enablement:

- Smart phones ownership amongst the middle income market was found not to equal usage and engagement. Thus, the smart phone type and phone capability could be a facilitator or barrier to customer adoption for this market.
- External customer needs emerged as both a market characteristic and need that some middle income customers had, that related to customers possessing certain products for attaining social status. This sub-factor emerged as an adoption facilitator to the external validation this market might desire.

II. Theme 2: Customer Needs:

- Primary financial customer needs such as payments and lending, were found to correlate with the maturity of mobile fintech segments. Therefore, the deeper the need the higher the customer adoption hence payment adoption rates are the highest for mass and middle income customer markets in South Africa. Meeting primary financial needs thus facilitated the customer adoption of mobile fintech.
- Latent customer needs were found to be met through mobile fintech product or service delivery. Such needs were related to simplicity, ease of use,

convenience and emerged as facilitators to customer adoption of mobile fintech.

III. Theme 3: Inclusive Marketing Innovation:

- Diverse customer marketing was found to be an inclusive practice that facilitated adoption amongst diverse ethnic or language groups within the middle income market.
- Inclusive product design and adaptive pricing practices was recognised as an adoption facilitator to successfully market to the diverse income levels that exist within the middle income market.
- Inclusive internal practices, such as the founders conceiving the fintechs, were found to be lacking within local mobile fintechs. This emerged as a barrier to customer adoption due to the homogenous products and services being created by mobile fintech innovators themselves.

IV. Theme 4: Digital Ecosystem:

- Collaborations between multiple fintech stakeholders emerged as an important sub-factor to enable a digital ecosystem. As such, traditional incumbent banks forming part of the mobile fintech ecosystem was key to accelerating customer adoption at macro-industry level.
- The Covid-19 pandemic was found to have disrupted high cash-use in certain middle income customer pockets, and this evidently facilitated the entrance of more customers into the beginning of a digital ecosystem.
    1. *Sub-theme 1:* Trust: Trust emerged as a required sub-factor to adopted customers of mobile fintech. It was found that diverse digital profiles within the middle income market require trust to either be formed in a purely digital environment or in hybrid forms i.e., a combination of offline and digital channels.
    2. *Sub-theme 2:* Digital Behaviour: this sub-theme revealed the ideal adopted customer who fulfils a variety of social, financial, and personal needs online. This type of digital behaviour facilitates the adoption mobile fintech for this market.

3. *Sub-theme 3:* Product Value: this sub-factor was found to strongly relate a low customer awareness amongst middle income customers, which acted as a barrier to their adoption of mobile fintech. Once the adopted customer recognises the high product value of mobile fintech, that recognition could in turn influence other customers to adopt.

6.1.4 *Conclusions for Research Question 4*

RQ4: Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech services?

Through a mixed discussion, this question gained the following insights:

- The middle income market customers in this sample had currently adopted mobile banking as their primary mobile fintech application. This meant that there was a limited variety of mobile fintechs used in this sample. Therefore, relating their digital customer behaviours with mobile fintech adoption was limited. Nonetheless, the low level of various mobile fintech penetration in their customer behaviour did not dampen the high digital financial activity found in their customer behaviour. This was evidenced by almost 80% of the sample using mobile fintech for all their personal and payment-specific financial transactions.
- The mixed customer adoption patterns received, for the types of mobile fintechs that middle income customers would use in the future, demonstrated confusion in the sample. Because of this, many responses were ungeneralisable. It was therefore posited that this market requires mobile fintech education - particularly around bitcoin payments and cryptocurrency fintech applications.

In conclusion, the study noted that this research question might lead to an assumption that middle income customers are a homogenous group due to the common affordability factor that being in the middle income market gives customers. Over the course of this study, it became clear that the middle income market was a complex customer market for mobile fintechs and other financial services to typify in terms of income. Therefore, there was a strong relationship

between digitally transformed customer behaviour and customer adoption of mobile fintech. However, the same relationship could not be applied to all middle income market customers who have digitally transformed customer behaviour.

6.2 Areas of Contribution

This study contributed to the literature on the rapidly changing financial technology literature for African contexts such as South Africa. As a primarily technology acceptance study, it sought to address the research gap for the middle income market in terms of their adoption of mobile financial technologies. This study assisted in contributing to the psychographic characteristics and cultural nuances of this market. Such characteristics, proved to address this study's identified problem of a lack of cultural and technological interoperability in this market.

This study's academic contribution was two-fold as a mixed methodology study and unique research design. Firstly, the mixed methods form of discussion provided a unique approach to exploring research questions. Secondly, the overall convergent research design where each instrument part was analysed separately (Creswell & Creswell, 2018) before merging for discussions provided operationalisation clarity for future researchers conducting mixed methodologies. These two approaches offered an opportunity for future research into the interplay of qualitative and quantitative data in the field of technology acceptance studies.

6.3 Recommendations

- Technology developers and fintech businesses could take advantage of the attitudinal barrier findings in this study. Mobile fintech companies should be cognisant of the psychological associations' consumers make about mobile fintech products and services. These associations and attitudes could be better shaped through marketing and evidence-based research, which would be integral to increased customer adoption in this market.
- The key finding in this study was the diversity in the middle income market. Although many commonalities were found, differences were also found. Therefore, mobile fintech companies should employ a "bottom-up" (Bick et al., 2020) approach to seek customer insights from customers themselves.
- Mobile fintech businesses should capitalise on middle income market customers with digitally transformed customer behaviour by firstly focusing on meeting latent customer needs like convenience and efficiency and using that value as their primary value proposition.
- Mobile fintech businesses could also build upon the highly adopted payment product in this market, by building on the payments infrastructure to attract and increase customer adoption for other types of mobile fintechs.
- Another key finding that could assist mobile fintech businesses was to possibly market mobile fintech as applications that require low data bandwidth or even zero-rate their use. In this way customer adoption would be stimulated for price sensitive customers in the middle income market.
- Mobile fintech businesses are encouraged to consider opening their mobile platforms for multi-sided engagement. The fast scalability exhibited by platforms such as AirBnb and Uber are primarily due to their location in the sharing economy. By opting not to lock customers into their platform and allowing P2P and B2C engagement could unlock far reaching network effects.
- Mobile fintech businesses could also segment their customers in a differentiated way that departs from demographic markers such as gender, age, and income. Utilizing other behavioural markers such as frequency, volume and variety of mobile fintech use could be explored.

6.4 Limitations of the study

- This study's sample was dominated by highly affluent middle income market customers which could potentially skew the findings and hinder generalising it to the greater South African middle income market population.
- The income values from the respondents were self-reported values, which limits the reliability of the results. Therefore, results should be carefully interpreted.
- This study was possibly exposed to interviewer bias during the semi-structured interviews. The semi-structured interviews required considerable interaction with participants, thus this component could make the study vulnerable to unintended interviewer bias.

6.5 Suggestions for Future Research

The achieved primary sample of 216 respondents was acceptable however, it was relatively small compared to other studies that have used SEM methodologies. It would be beneficial to redo this study for the South African middle income market with a larger sample size.

In addition, due to the limited time and scope of this master's research, more facilitators and obstacles could be explored that are more context and culturally specific to South Africa (Kane et al., 2019).

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APPENDIX (A) *Consistency Matrix*

RQ #	Research Objectives	Research Question	Methodology	Data Collection Detail	Data Analysis Method	Data Merging Detail
1.	**RO1:** Examine the customer adoption barriers and facilitators of mobile fintech in the middle income market**.**	**Q1:** What are the middle income market's adoption barriers and facilitators of mobile fintech?	QUANTITATIVE METHOD	Questionnaire Instrument Part 1	Structural Equation Modelling (SEM)	None
2		**Q2:** How do the qualitative findings further explain the customer adoption barriers of mobile fintech according to middle income market customers?	MIXED METHOD	Questionnaire Instrument Part 2	Descriptive Data Analysis	Mixed Discussion (Instrument Part 1 and 2)
3		**Q3:** What factors influence the customer adoption of mobile fintech in the middle income market?	QUALITATIVE METHOD	Semi-Structured Interviews – Instrument Part 4	Thematic Analysis	None

4	***RO2:*** *Explore the relationship between digitally transforming customer behaviour and the* customer adoption *of mobile fintech in the middle income market*	**Q4:** Do middle income market customers with digitally transformed customer behaviour adopt mobile fintech services?	MIXED METHOD	Questionnaire Instrument Part 3	Content Analysis	Mixed Discussion (Instrument Part 3 and 4)

APPENDIX (B) *Interview Information Sheet*

Subject Matter Expert

Dear ……

I am a Master of Management candidate in Digital Business enrolled at the Wits Business School. As part of my research, I am investigating “customer adoption of mobile fintech in the South African middle income market” under the supervision of Dr. Manessah Alagbaoso. I would like to invite you to take part in this research as an anonymous interviewee. You have been identified as a potential participant as I believe your input could greatly enrich this research.

For this research, mobile fintechs are digital financial services such as mobile payments, peer2peer lending, insurtech, social media currencies and digital-only banking platforms accessed via mobile phones (this list is not exhaustive). The interview will take 45min to 1 hour of your time and will involve you answering questions regarding your perceptions and professional experiences of South Africans current and predicted adoption of such mobile fintech services and applications. The objective of this interview is to provide subject matter expertise on the barriers and facilitators to customer adoption for economically enabled South Africans such as the middle income customer. Depending on your acceptance of this invitation, the list of questions to be asked can be shared with you before the interview.

Recording:

Please note that the interview audio will be recorded and later transcribed. Post the interview, a draft transcription will be supplied to you to verify accuracy prior to the final report being produced.

Permission:

The interview transcript will be completely anonymous as I will not be asking for your name, or any identifying information except your job title. You will be required

to sign a consent form and I can sign a non-disclosure agreement provided by you.

Please note that the interview can either be conducted online via Zoom/MS Teams or in-person depending on your availability and location. If you have any questions about this research, feel free to contact me on the details listed below.

Looking forward to your response.

Yours sincerely,

Researcher: Miss. Lucy Jacobs
Email: 1671965@students.wits.ac.za
Cell: 083 857 8083
Supervisor: Dr. Manessah Alagbaoso
Email: Obinali.Alagbaoso@wits.ac.za;

APPENDIX (C) *Interview Consent Form*

I, …… agree to participate in this research project. The research has been explained to me in the information email, and I understand what my participation will involve. I agree to the following:

(Please select your answer below)

• I agree that my participation will remain anonymous.	**YES**	**NO**
• I agree that the researcher may use my anonymous quotes and job title in her research report.	**YES**	**NO**
• I agree that the interview audio may be recorded, and I will provide information that upholds the integrity and quality of the research outcome.	**YES**	**NO**

…… (signature)

…… (name of participant)

…… (date)

…… (signature)

…… (name of Researcher seeking consent)

…… (date)

APPENDIX (D) *Information Email - Questionnaire*

Good Day,

You are invited to participate in a questionnaire regarding your digital behaviours and likely adoption of mobile fintech services and applications. My name is Lucy Jacobs, and I am a Master of Management student in Digital Business at the Wits Business School. As part of the required research project, I am investigating customer adoption of mobile fintech (financial technologies) in the South African middle income market. This research is done under the supervision of Dr. Manessah Alagbaoso.

Link: **https://wits.eu.qualtrics.com/jfe/form/SV_3xxnogyY3bDXi7k**

The questionnaire will take 15 - 20 min of your time, and will be completely anonymous as no identifying information will be requested. If you have any questions about this research, feel free to contact me on the details listed below. Please note that this study will be written up as a research report.

Yours sincerely,

Researcher: Miss. Lucy Jacobs

Email: 1671965@students.wits.ac.za

Supervisor: Dr. Manessah Alagbaoso
Email: Obinali.Alagbaoso@wits.ac.za;

APPENDIX (E) *Ethics Clearance Certificate*

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE **PROTOCOL NUMBER WBS/BA1671965/574**

PROJECT TITLE Customer adoption of mobile fintech in the South African middle income market

INVESTIGATOR Miss Penelope Jacobs

SCHOOL/DEPARTMENT OF INVESTIGATOR MM (Digital Business)

DATE CONSIDERED 24 November 2020

DECISION OF THE COMMITTEE Approved unconditionally

RISK LEVEL LOW RISK

EXPIRY DATE 30 JUNE 2021

ISSUE DATE OF CERTIFICATE 7 December 2020 **CHAIRPERSON** _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Dr. Alagbaoso

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

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

Signature **Date** 08/12/2020

APPENDIX (F) Instrument Part 1: *Demographics*

	Question					*CATEGORY*
1.1	**Please select your gender**	**a.** Female	**b.** Male	**c.** Prefer not to say		*Demographics - Gender*
1.2	**Please select your age range**	**a.** 20 years and under	**b.** 21-35 years old	**c.** 36-55 years old	**d.** 56 and above	*Demographics - Age*
1.3	**Please select your education level**	**a.** High School qualification or below	**b.** Diploma / Bachelors qualification	**c.** Post-graduate qualification		*Demographics - Education*
1.4	**Please select your nationality**	**a.** South African (by birth)	**b.** Naturalised South African	**c.** Non-South African citizen (permanent resident / foreign national)		*Demographics - Nationality*
1.5	**After tax deductions, what is your monthly individual income?**	**a.** Between R 1400 - R 3 656	**b.** Between R 3 656 - R 10 000	**c.** Between R 10 000 - R 25 000	**d.** More than R 25 000	*Middle Income Position - Individual*
1.6	**After tax deductions, what is your households accumulated monthly income?**	**a.** Less than R 3 656	**b.** Between R 3 657 - R 9 999	**c.** Between R 10 000 - R 24 999	**d.** More than R 25 000	*Middle Income Position - Household*
1.7	**How many total people (dependants included) in your household depend on the stated household income?**	**a.** Between 1 - 3 people (including me)	**b.** Between 4 - 6 people (including me)	**c.** More than 7 people (including me		*Middle Income Position - Household*
1.8	**How often do you use the internet per day?**	**a.** Less than 1 hour	**b.** 1 -2 hours	**c.** 2 - 3 hours	**d.** More than 3 hours	*Digital Profile - usage*
1.9	**Which statement best describes you?**	I am usually offline and like to limit how digitally connected I am.	I only became digitally connected as an adult, and mainly connect online to seek information / knowledge.	I was born into a digital world (since childhood), and many aspects of my life are online e.g. social networks, finances, work etc.	I only became digitally connected as an adult, and so many aspects of my life are now online e.g. social networks, finances, work etc.	*Digital Profile - behaviour*

Instrument Part 1 continued: *UTAUT-TAM*

		Likert Scale	**1**	**2**	**3**	**4**	**5**
	#	**Please select your level of agreement or disagreement to the following statements.**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Effort Expectancy (EE)	**2.1.1**	Learning how to use a fintech application on my mobile phone is easy for me.					
	2.1.2	My interaction with mobile fintech applications is clear and understandable for me.					
	2.1.3	It is easy for me to become skilfull at using mobile fintech applications.					
Facilitating Conditions (FC)	**2.2.1**	I have the resources [smart mobile phone and internet connection] necessary to use mobile fintech applications.					
	2.2.2	I have the knowledge required to use mobile fintech applications.					
	2.2.3	I can get help from others when I have difficulties using mobile fintech applications.					
Hedonistic Performance Expectancy (HPE)	**2.3.1**	Using mobile fintech applications is pleasant.					
	2.3.2	I find using mobile fintech applications enjoyable.					
	2.3.3	The process of using mobile fintech applications is fun.					

Utilitarian Performance Expectancy (UPE)	**2.4.1**	I find mobile fintech applications very useful in conducting digital financial transactions.					
	2.4.2	I save time and money when I use mobile fintech applications.					
	2.4.3	Utilizing mobile fintech applications will enable me to reach my financial goals faster.					
Trust	**2.5.1**	I believe mobile fintech applications are trustworthy.					
	2.5.2	I would not check terms and conditions, because I trust mobile fintechs keep their customers' interests in mind.					
	2.5.3	I believe mobile fintechs would do everything to secure my transactions - from small to large ones					
Self-efficancy	**2.6.1**	I will use mobile fintech applications only if there is a built-in help facility for assistance.					
	2.6.2	I will use mobile fintech applications provided that someone showed me how to use it first.					
	2.6.3	I am confident in using mobile fintech applications only if someone else helped to get started.					
Security	**2.7.1**	I feel secure providing my personal financial information such as card details on a mobile fintech application.					
	2.7.2	I feel totally safe managing my finances through a mobile fintech application, even if I have never used such an application before.					
	2.7.3	I would feel secure if I was informed about the security measures that mobile fintech applications use before conducting any financial transaction.					

Privacy Risk (PR 1)	**2.8.1**	I think using mobile fintech application puts my personal information privacy at a high risk.					
	2.8.2	Using mobile fintech applications exposes me to an overall risk e.g. leaking my information without my consent.					
	2.8.3	I think mobile fintech applications will not protect my personal information from being exposed.					
Performance Risk (PR 2)	**2.9.1**	The possibility that something will go wrong with the performance of the mobile fintech application is high.					
	2.9.2	I worry that mobile fintech applications will not perform well during transactions and then create problems with my finances.					
	2.9.3	I think it is risky to entrust mobile fintech applications with such high expectations of service performance.					
Attitude	**2.10.1**	Using mobile fintech applications is a good idea.					
	2.10.2	I like the idea of using mobile fintech applications for my financial transaction					
	2.10.3	I think it is valuable to use mobile fintech applications.					
Social Influence (SI)	**2.11.1**	People close to me think I should use mobile fintech applications.					
	2.11.2	I will use mobile fintech applications if most of my friends used it.					
	2.11.3	People who influence my behaviour think I should use mobile fintech applications.					

Behavioural Intent (BI)	**2.12.1**	I intend to use mobile fintech applications.					
	2.12.2	I predict that I will use mobile fintech applications in the future.					
	2.12.3	If given the opportunity, I plan to use mobile fintech applications in the near future.					
Use Behaviour (UB)	**2.13.1**	I frequently use mobile fintech applications.					
	2.13.2	Most of my financial activity is conducted on a mobile fintech application.					
	2.13.3	I currently use mobile fintech applications on a regular basis.					

APPENDIX (F) Instrument Part 3: *Open-Ended Questions*

Q 4	Please describe your experiences with mobile fintechs below.				
#	Question	Yes (%)	No (%)	Comment	*Category*
4.1	Have you used mobile fintech applications before? If yes, please name the application and detail your experience. If no, please explain why not?				*Current Usage and type*
4.2	What type of mobile fintech product do you want to use in the future and why? Examples are insurance, lending, investments, online trading, cryptocurrency etc.?				*Future Fintech Segment Penetration Analysis*
4.3	Do you conduct all your personal financial transactions digitally? If yes, please explain why. If no, please explain why in the box below.				*Digital Behaviour Analysis*
4.4	Do you use mobile fintech applications for all your payment needs?				*Offline Behaviour Analysis*
4.4.1	Please select the amount of cash payments you make in a month.	1-2 cash payments	3 or more cash payments		*Offline Behaviour Analysis*

APPENDIX (G) Analysis: *Middle Income Market*

Middle Income Individual (MIM) Qualifiers:

Each combination block (1-8) indicates respondents' individual income ("X") under blue block, and the required household combination to satisfy MIM qualification.

Combination.1. (lower band middle income)		Option A R 1 400 - R 3 656	Option B	Option C	Option D
Question 1.6	Individual	X			
Question 1.7	Household		X	X	X

Combination.3. (higher-band middle income)		Option A	Option B	Option C R 10 000 - R 25 000	Option D
Question 1.6	Individual			X	
1.7	Household			X	X

Combination.2. average middle income)		Option A	Option B R 3 656 - R 10 000	Option C	Option D
Question 1.6	Individual		X		
Question 1.7	Household		X	X	X

Combination.4. (affluent middle income)		Option A	Option B	Option C	Option D R 25 000
Question 1.6	Individual				X
Question 1.7	Household				X

Middle Income Individual Disqualifiers

Combination.5. (lower band middle income)		Option A R 1 400 - R 3 656	Option B	Option C	Option D
Question 1.6	Individual	X			
Question 1.7	Household	X			

Combination.7. (higher band middle income)		Option A	Option B	Option C R 10 000 - R 25 000	Option D
Question 1.6	Individual			X	
Question 1.7	Household	X	X		

Combination.6. (average middle income)		Option A	Option B R 3 656 - R 10 000	Option C	Option D
Question 1.6	Individual		X		
Question 1.7	Household	X	X		

Combination.8. (affluent band middle income)		Option A	Option B	Option C	Option D R 25 000
Question 1.6	Individual				X
Question 1.7	Household	X	X	X	

APPENDIX (H) Instrument Part 4: *Interview Guide*

1. Context *(4)*

1.1. In terms of monetary value, where would you place the middle income market in the income distribution of South Africa?

1.2. Do you think customers income level influences their intention to adopt mobile fintech applications? If no, please explain. If yes, please explain.

1.3. In your opinion, what other factors besides income influence the adoption of mobile fintech for middle income customers?

1.4. How do you segment the customer market in the mobile fintech industry? Please name the segmentations.

2. Mobile fintech adoption barriers *(5)*

2.1. What do you think are the adoption barriers of mobile fintech adoption in the South African middle income market?

2.2. Which of the barriers you've mentioned have the most influence on mobile fintech adoption for the middle income market?

2.3. Which mobile fintech segment currently has a highest adoption rate in the South African market?

2.3.1. What do you think are the reasons behind this particular mobile fintech segment's higher adoption rate?

2.3.2. Which other mobile fintech segment do you predict is likely to be adopted in the next 1 – 3 years by the middle income market?

3. UTAUT-TAM *(4)*

Interviewer will explain the UTAUT-TAM theoretical model used for this study; she will share a picture of the instrument and explain the interplay between the variables. The UTAUT-TAM variables are: Trust, Attitude, Performance Risk, Privacy Risk, Security, Self-Efficacy, Social Influence, Utilitarian Performance Expectancy, Hedonic Performance Expectancy, Effort Expectancy, Facilitating Conditions (all preceding variables are independent variables). Lastly, Behavioral Intention and Behavioral Usage are the dependent variables

3.1. Which independent variable do you think has the most positive impact on customer intent and usage of mobile fintech services and applications?

3.1.1. What are the reasons behind your selected variable?

3.2. Which independent variable do you think has the least impact on customer intent and usage of mobile fintech services and applications?

3.2.1. What are the reasons behind your selected variable?

4. Relationship between digital transformation and mobile fintech adoption *(6)*

4.1. Between digital natives and digital immigrants, which of these identities best personifies the average mobile fintech user?

4.2. Please describe the kind of financial behaviors/activity you think are evident in a customer segment that has digitally transformed behavior?

4.2.1. In your knowledge, do cash-based transactions still feature in the financial behavior of a customer that uses mobile fintech?

4.3. Please describe the kind of digital behaviors you think are evident in a consumer segment that has adopted mobile fintech services and applications?

4.4. Do you think there is a relationship between digitally transformed customer behaviour and mobile fintech adoption?

4.4.1. Why do you think there is a relationship or why not?

5. Any other additional information *(2)*

5.1. Please share any suggestions you may have on how to increase mobile fintech customer adoption for the middle income market.

5.2. Please share any other information that you think would be valuable to this study.

Total number of questions: 21

APPENDIX (I) Data Analysis: *UTAUT-TAM Model (Part 1)*

I. *Skewness and kurtosis of the constructs*

Constructs	Skewness	Kurtosis
Effort expectancy	-1.70	5.50
Facilitating Conditions	-2.04	7.29
Hedonic Performance Expectancy	-0.95	3.70
Utilitarian Performance Expectancy	-1.62	6.01
Trust	-0.46	3.15
Self-Efficacy	0.11	2.08
Security	-0.54	2.99
Risk	-0.41	2.60
Attitude	-1.17	4.72
Social influence	-0.19	2.62
Behavioural intention	-1.35	5.24
Use Behaviour	-1.28	3.66

II. *CFA: Structural UTAUT-TAM Model: Goodness of fit results*

Comparison of all fit indices, with their corresponding recommended values, provided evidence of a good structural model fit:

Fit Indices	**Recommended Range**	**Result**
χ2/df (chi-square to degrees-of-freedom	> 3	21.95
AGFI		0.761
RMSEA (root mean square error of approximation	< 0.06	0.06
SRMR (standardized root mean square residual)	< 0.08	0.07
CFI (comparative fit index)	< 0.95	0.918
TLI (Tucker-Lewis Index)	< 0.95	0.903
GFI (goodness-of-fit)	n/a	0.811
NFI (normalized fit index)	< 0.95	0.848
NNF I (non-normalised fit index)	< 0.95	0.903
RFI (relative fit index)	< 0.95	0.819

APPENDIX (J) Codebook: *Data Analysis of Interviews (Part 4)*

I. ***Coding System from internal perspective***

Mobile Fintech Internal Perspective on customer adoption in South African middle income market				
Initial Code List (x 122)	***Q #***	***Code (x49)***	***Code Criteria***	***Categories (x 19)***
<u>Context</u> – *Income market landscape* • Middle income indicator: R 8 000 – R 18 000 gross per month • Middle income indicator: R 15 000 – R 25 000 gross per month • All income groups adopt Crypto	**Q 1.1**	C.SEGM: DEMOG	• Refers to monetary values for middle income market • Refers to income thresholds for South African customer market	*Not categorized*
<u>Income as influencer to customer adoption</u> • Income influences fintech adoption • Fintech mobile application penetration more influential than income to customer adoption • Income was not a factor to Mpesa's high customer adoption • The more income the higher likelihood of fintech adoption • Income is not a prerequisite for fintech access and exposure • Income influences the level of customer engagement • Customer exceptions exist where a few Millennial segments earn	**Q 1.2**	ADOP: INCOME ACCESS: ENGAGE: INCOME	• Refers to how income influences customer adoption of mobile fintech • Refers to how income influences middle income segment	• Income as access point to adoption ○ Sub-Category: Financial Enablement • Engagement is across income segments

high income from crypto trading **<u>Middle Income Market Characteristics</u>** • It's the middle income group that uses banks • It's the middle income group that uses fintech • South African culture is aspirational • South African consumers overcome income barriers for aspirational desires • Fintech is accessible to middle income group • Mobile payment apps are used widely in upper middle income • Higher middle income group desire and adopt variety of fintech • Middle income group use savings and investment apps • South African Middle income group fall into 'get rich quick' schemes • Middle income customers do not trust fintech • Middle income customers have financial security concerns • Middle income customers have platform security concerns • Lower income group adopt USSD fintech • Upper middle income adopt mobile fintech apps	**New**	ADOP.F: MI USE FINTECH ADOP.F: MI USE BANKS ADOP.F: MI APPEARANCE ADOP: USSD FOR LI INCOME ADOP: APP FOR MI INCOME ADOP.B: MI SKEPTISM	• Refers to middle income customer group in terms of their segment behaviour as a group • Refers to middle income customer group in terms of segment identifying characteristics (concerns, personality types) • Refers to middle income market consumer in terms of adoption barriers due to characteristics • Compares to upper to lower middle income segment use of financial services	• External Customer Needs • Financial Customer Needs

<u>Customer Segments in fintech</u> • Crypto customer segmentation between Pro Traders and Retail Trader segments • Retail crypto segment is for casual consumers • Retail crypto traders have low usage of mobile application • Customer segment is not based fintech product • Customer segment is based on customer behaviour: frequency and use • Crypto customer segments are both currently growing • Currently small retail customer segment is predicted for massive adoption • Crypto customer segment only use digital financial services • Fintechs aim is to meet needs of both customer segments in retail and pro traders • Fintech revenue comes from 20 percent of business – pro traders • Crypto revenue is mainly based on pro trader segment	**Q1.4**	C.SEGM: LOW MASS USE C.SEGM: DIFF. NEEDS ADOP.B: DIFF. DIGITAL NEEDS ADOP.B: UNEQUAL USE IN SEGMENTS	• Refers to how fintech companies segment customer market • Refers to the current fintech use of different customer segments • Refers to the fintech companies perceptions on customer segments	• Customer Identity Disunity • Customer Usage Disunity

<u>Facilitators to customer adoption</u> • Relationship between smart phone ownership and fintech adoption • South African consumers overcome smart phone barriers for accessibility to resources • Fintech adoption increases with smart phone penetration • USSD can also be defined as fintech • USSD fintech is more accessible and enables more customers to adopt • HPE is an influencer to adoption • Customer experience is a major influence to the adoption of fintech • Fintech benefits outweigh negative consumer concerns • Smart phone capability is important to access fintech applications (facilitating conditions) • Social influences positively influences customer adoption • Consumer ease of use because Insurtech is online	**Q3**	ACCESS: PHONE ADOP.F: CUSTOMER JOURNEY ADOP.F: HPE ADOP.F: SI ADOP.F: EE ADOP.B: PHONE MODEL	• Refers to any factor that facilitates customer adoption in middle income market, besides income • Refers to an additional emergent factors that are not explicitly used in the UTAUT-TAM model	• Phone Quality ○ Sub-Category: Phone quality determines customer journey

Fintech product value as facilitator to customer adoption • Product value of crypto has recently increased in international market • Customers in retail segment are unaware of the benefits of crypto products • As customer awareness of product value increases then adoption will spike and scale • Customer financial returns on crypto are high if barriers are overcome	**New**	F.SEGM: CRYPTO GLOBAL ADOP.B: UNAWARE ADOP.B: HIDDEN PRODUCT VALUE	• Refers to fintech segment developments that impact customer adoption • Refers to emergent factors related to current local fintech products and services	• Under-stimulated Customer Adoption ○ Sub-Category: Undersold product value
Barriers to mobile fintech adoption • Data is expensive in South Africa • Lack of open access data is a barrier to all groups • Hidden fees are a consumer concern • Lack of financial literacy is a barrier to fintech adoption • Open access data is mainly urban areas • Fintech apps absorb data which increasing price sensitivity • Access to data is a barrier to customer adoption of digital products (facilitating condition) • Lack of knowledge is a barrier to crypto adoption	**Q 2.1 – 2.2**	ADOP.B: DATA COSTS C.SEGM: PRICE SENSITIVE ADOP.B: LOW FINANCIAL LIT. ADOP.B: IGNORANCE	• Describes customer adoption barriers in middle income market • Uses factors that could be both facilitators or barriers however, uses the factor negatively. • Defines a customer segment characteristic as a barrier	• Socio-economic barriers to customer adoption

• Lack of guidance is a barrier to crypto adoption				
<u>Fintech segments in south Africa</u> • Initial digital touch point makes an easy insurtech customer experience • Banking has the highest customer adoption rate • Predicts Insurtech will be the next product middle income customers will adopt • Fintech segments depend on definitions • Stokvels will not likely have big adoption • Investment apps will have high customer adoption than digital stokvels • Insurance is an essential service • Insurtech value is that it removes physical interactions with medical people and hospitals • Predicts Cryptocurrencies will be the next product middle income customers will adopt	**Q2**	ADOP.F: CUSTOMER JOURNEY F.SEGM: BANKS LEAD F.SEGM: ESSENTIAL SERVICES	• Refers to predicted fintech segment developments that impact customer adoption • Describes fintech landscape in South Africa in terms of rank, current preferences and anticipated customer uptake	• Customers need Financial Services ○ <u>Sub-Category</u>: Bank monopoly blinds customers to see fintech value
<u>Trust as barrier to mobile fintech adoption</u> • More financial education would increase customer trust in fintech • Consumer trust barrier exists for digital financial products	**Q2**	ADOP.B: TRUST C.SEGM:	• Describes middle income customers in terms of their perceptions of mistrust and low tolerance for new products	

• Trust is the major influencer to the adoption of fintech • Consumers are cautious about the money • Trust is a prerequisite to using fintech • Phones are not as reassuring as physical interaction • Customers will need to rely on inherent trust for fintech • Scam occurrence is high in crypto customers • Lower income group don't trust banks • Lack of trust is an impediment to customer adoption of fintech • Brand trust can be created in an online environment • If consumers trust fintech then they can forgive performance issues • Customer attitudes can be passive resulting in falling for scams • Consumer trust is a barrier to fintech adoption		LOW TRUST ADOP.F: EDUCATION	related to finances. • Refers to negative and positive factors that build or break down customer trust	• Trust as customer protection
<u>Not a barrier to customer adoption</u> • Risk is a concern for developed countries • Risk is not a barrier for middle income customers in South Africa • Performance risk has little influence on	**Q3.2**	C.SEGM: MI LOW RISK	• Describes middle income customers perceptions in terms of their current little concern for risk	*Not categorised*

customer adoption of fintech				
<u>Banks</u> • Bank account is needed even for non-financial services • Banks are only useful for lending • Banking services are tied to mobile application use	**Q2**	C.SEGM: BANKS LEAD ADOP.F: DIGITAL BANKS	• Refers to the characteristics of banking in South Africa (current use, consumer perceptions, level of penetration).	• Bank monopoly
<u>Customer needs</u> • Financial services are needed services • Insurtech product design according to consumer needs • Personalised online product design for insurtech customers • Identified need is lack of insurance for consumers earning less than R 30 000 per month • Fintech meets consumer needs quickly	**NEW**	ADOP.F: SPEED ADOP.F: DESIGN ADOP.F: CONSUMER NEEDS	• Refers to the ways in which the fintech services currently meet local customer needs • Refers to the customer needs that fintechs have identified for local customers	• Latent customer needs

Covid disruption as customer adoption facilitator • Covid was unpredictable • Covid changed insurtech industry • Covid increased insurtech adoption • Covid has heightened consumer awareness for insurance product • Covid has increased consumer awareness of their need for insurtech • Customer adoption of insurtech should have taken 3 more years but Covid accelerated adoption curve • Covid has influenced fintech usage • Covid has significantly increased crypto adoption	**NEW**	ADOP.F: COVID ADOP.F: COVID.DIGITAL INCREASE	• Refers to the beneficial customer uptake that fintech companies experienced from the Covid-19 pandemic in South Africa	• New customer needs arise due to Covid impact
Digital Persona customer behaviour • Social personas of customers determines what will influence them to fintech adoption • Digital natives are primary adopters of fintech • Personas don't matter more than comfort with transacting digitally • Digital immigrants personify fintech customers in South Africa • Digital immigrants are older with income and more likely to digitally transact	**Q 4.1**	ADOP.F: D.NATIVES C.SEGM: D.NATIVES: PRIMARY ADOP.F: EASE WITH DIGITAL	• Refers to the personas of digital natives and digital immigrants within the customer landscape in the middle income market.	Digital Behavioural Integration Rules Over Persona Segment

<u>Digitally transformed customer behaviour</u>: • Fully digitally adopted customer uses mobile payments and e-commerce • Fully digitally adopted middle income customer has high trust for e-commerce • Middle income digital habits include international e-commerce purchases • Strong relationship between digital adoption and mobile fintech adoption	**Q 4.4**	ADOP.F: D.NATIVES C.SEGM: D.NATIVES: TRUST	• Refers to Refers to the markers of digitally transformed customer behaviour	Consumer trust gained over long period e.g. digital natives
<u>E-Commerce</u> • Customer comfort with e-commerce is easily transferred to mobile fintech • Strong customer relationship between spending and transacting digitally • Customer paying with smart phone equals comfort with digital channels • Digitally transformed customer trusts digital channels	**Q 4.3**	ADOP.F: HIGH MOBILE USE ADOP.F: MI USE ECOMMERCE	• Describes online e-commerce behaviour as an indicator of digitally transformed behaviour for the middle income customer	Consumer trust gained through e-commerce experience

Customer usage/habits of mobile fintech • Gap exists between Intention and actual usage of fintech • Fintech mobile app can remain unused • Digital ecosystem is necessary for consumer usage	**NEW**	ADOP.B: LOW USAGE	• Refers to the reasons behind a lack of customer usage of mobile fintech	• Under-stimulated Customer Adoption
Cash use in middle income group who use mobile fintech • Cash use is lessening in the upper middle income group • Cash is king for lower end middle income group • Cash is still evident for middle income customers • Cash use versus digital financial behaviour is not mutually exclusive	**4.2**	ADOP.B: CASH	• Refers to the factors behind continued use of cash for the middle income market customer customer	• Cash economy

II. ***Coding System from external perspective***

Mobile Fintech External Perspective on customer adoption in South African middle income market				
Initial Code List (x 122)	***Q #***	***Code (x46)***	***Criteria***	***Category (x21)***
Context – *Income market landscape* • Middle income indicator: R 4 000 – R 20 0000 • Upper middle income is above R 40 000 • Middle income indicators differ according to their market definitions • Middle income Market Indicator: R 6 000 – R 30 000 per month for individuals	**Q 1.1**	C.SEGM: DEMOG	• Refers to monetary values for middle income market • Refers to income thresholds for South African customer market	*Not categorized*
Income as an influencer to customer adoption • Income level does not influence adoption • Affordability does not influence adoption willingness • Income relates to financial inclusion • Income relates to digital literacy • Income is the enabler of facilitating conditions • Income is the biggest impactor of customer adoption	**Q 1.2**	ADOP: INCOME ACCESS ENGAGE: INCOME	• Refers to how income influences customer adoption of mobile fintech • Refers to how income influences middle income segment	• Engagement is across income segments • Income as access point to adoption ○ Sub-Theme: Financial Enablement

<u>Middle Income Market Characteristics</u> • High financial inclusion in South Africa compared to other countries • Customers in middle income market do not have a compelling reason to switch to a substitute provider like a fintech • Higher income customer can differentiate value between non-bank fintech solutions	**New**	ADOP.F: MI USE BANKS ADOP.B: MI SKEPTISM	• Refers to middle income customer group in terms of their segment behaviour as a group • Refers to middle income customer group as in terms of segment identifying characteristics (concerns, personality types) • Refers to middle income market consumer in terms of adoption barriers due to characteristics	• Financial Customer Needs • External Customer Needs
<u>Customer Segments in fintech</u> • Customer segmentations depends on context • Customer segments are not 'one size fits all' • Fintech companies can target customers according to segment characteristics • Customer segments according to needs is a sophisticated segmentation approach • Fintech companies can segment according to	**Q 1.4**	C.SEGM: DIFF. NEEDS	• Compares to upper to lower middle income segment use of financial services • Refers to how fintech companies segment customer market	• Customer Identity Disunity

the type of customer they are solving for • Fintech companies currently use demographic customer segmentations to target • South African fintech companies segment customers according income, race, gender, profession characteristics • Global fintech companies segment customers on a needs basis • Customer segments that are income based are from Banks • Customer segments via life cycle stages is another financial sector approach • Customer segmentation based on income is not nuanced for increasing adoption of mobile fintech			• Refers to the current fintech use of different customer segments • Refers to the fintech companies perceptions on customer segments	• Customer Usage Disunity
<u>Facilitators to customer adoption</u> • Fintech companies should look for needs that are not already addressed by banks in South Africa • Customer adoption of mobile fintech is positively influenced by Utilitarian (UPE) • Customer network effects increases customer adoption	**New**	ACCESS: PHONE ADOP.F: UPE/NEEDS ADOP.F: SI / NETWORKS	• Refers to any factor that facilitates customer adoption in middle income market, besides income • Refers to an additional emergent factors that are not explicitly used in the	• Phone Access • Latent Customer Needs

• Customer needs being addressed ensures a fintechs product market fit • EE or ease of use positively influences customer adoption of mobile fintech • High barriers of facilitating conditions are overcome by consumers if EE, UPE and SI are present • Customer adoption is positively influenced by EFF and UPE in middle income market • More facilitators exist for customer adoption of bank fintechs in the middle income market • Smart phones give access to mobile fintech products		ADOP.F: EE	UTAUT-TAM model	
<u>Fintech product value as facilitator to customer adoption</u> • Lending fintech companies are innovating in how they understand customers • Lending fintech companies are more flexible than banks • Fintech companies being culturally in touch determines identification of customer need	**New**	F.SEGM: LENDING OPP ADOP.F: CAPTURE CUSTOMER ADOP.F: HIDDEN PRODUCT VALUE	• Refers to fintech segment developments that impact customer adoption • Refers to emergent factors related to current local fintech products and services	• Under-stimulated Customer Adoption ○ Sub-Theme: Undersold product value

• Customers not aware of mobile fintech benefits • Mobile fintech apps do not utilize a lot of data • Fintech products make customer onboarding simpler **<u>Barriers to mobile fintech adoption</u>** • Low income is a barrier to customer adoption of mobile fintech • High data costs are a barrier to customer adoption of mobile fintech (facilitating conditions) • Lack of smart phone penetration is a barrier to customer adoption (facilitating conditions) • Lack of network coverage is a barrier to customer adoption (facilitating conditions) • Lack of digital literacy is a barrier to customer adoption • Lack of fintech awareness is a barrier to mobile fintech adoption in middle income market • Price sensitivity is a barrier to customer adoption of mobile fintech in the middle income market • More barriers exist for customer adoption of non-bank fintechs in the middle income market • Lack of data affordability is a barrier across all income groups	**Q 2.1 – 2.2**	ADOP.B: LOW INCOME C.SEGM: PRICE SENSITIVE ADOP.B: DIGITAL LITERACY ADOP.B: DATA/NETWORK	• Describes customer adoption barriers in middle income market • Uses factors that could be both facilitators or barriers however, uses the factor negatively. • Defines a customer segment characteristic as a barrier	• Socio-economic barriers to customer adoption

<u>Fintech segments in South Africa</u> • Local fintech companies are trying to stimulate adoption in lower income customers • Low fintech penetration is in insurance, savings and investments segments • Customer network effects increases fintech scalability • Lending is an emerging fintech segment to be adopted by middle income customers • Fintech companies tailor marketing according to targeted customer segment • Fintech companies in South Africa need more diversity • Fintech products in in South Africa are currently copycats from developed markets • Fintech products developed by local fintech companies should be organic to the South African market • Payments is leading the fintech segments because it has many customer touchpoints • Non-bank fintechs have not experienced high customer adoption • Customer adoption of non-bank fintech very	**Q2**	ADOP.B: LOW LOCAL INNOVATION F.SEGM: LOW CUSTOMER ADOP. ADOP.F: TARGET MARKETING F.SEGM: PAYMENTS LEAD F.SEGM: LENDING OPP ADOP.F: DESIGN	• Refers to predicted fintech segment developments that impact customer adoption • Describes fintech landscape in South Africa in terms of rank, current preferences and anticipated customer uptake	• Inclusive Innovation Product Design

high in other emerging markets • Fintech products are offered by companies like mobile networks who are outside of the banking system • Fintech apps are successful in other emerging markets except South Africa • Fintech companies in emerging markets, unlike South Africa, were not competing with Banks • Fintech companies took advantage of high banking fees for payments to offer a convenience alternative to customers • Lending fintechs can influence customer adoption through alternative credit assessments for customers • Fintech companies in South Africa have been lazy in customer targeting • Fintech companies in South Africa currently target high income customer segment • Fintech product design currently does not target lower middle income or lower income groups • Lack of marketing to diverse consumers across income spectrum is a barrier to network effect in South Africa • Fintech companies currently do not target lower middle income or lower income groups				

• Fintech companies in South Africa need to innovate for lower and middle income segments as well • Customer adoption will take place when fintech product design has a culture shift to meet lower to middle income needs • Customer adoption of mobile fintech lies in fintechs targeting mass market customers • Fintech companies should target mass market customer because it has more value due to their volume as opposed to higher income customer segments • South African future financial ecosystem is not unique • South African ecosystem approach is a worldwide trend • Payments has highest local customer adoption **<u>Trust as barrier to mobile fintech adoption</u>** • Social Influence validates trust for mobile fintech • Lack of trust is a strong barrier to mobile fintech adoption in middle income market • Customers are less trusting due to the nature of financial services	**Q2**	ADOP.B: TRUST C.SEGM: LOW TRUST ADOP.F: EDUCATION	• Describes middle income customers in terms of their perceptions of mistrust and low tolerance for new products related to finances.	• Trust as customer protection

• Lack of customer trust, risk and security negatively influences customer adoption of mobile fintech • Lack of security on digital fintech apps negatively influences customer adoption			• Refers to negative and positive factors that build or break down customer trust	
<u>Not a barrier to customer adoption</u> • Risk is not a very important factor to customer adoption of mobile fintech • Risk is mitigated against by regulators whether seen and unforeseen by customer • Risk does not impact the adoption of lending and payment fintech products • Crypto-assets are an exception to risk variable influencing customer adoption • Social influence might not be a facilitator of customer adoption • Facilitating conditions has little influence on customer adoption in the middle income market • Customers do not expect HPE / experience out of mobile fintech apps	**Q.3.2**	C.SEGM: MI LOW RISK	• Describes middle income customers perceptions in terms of their current little concern for risk	*Not categorized*

<u>Banks</u> • High banking penetration in South Africa affects the lack of customer adoption of mobile fintech • Mpesa succeeded in Kenya because of low banking penetration • Consumer income groups across spectrum in South Africa are banked • Mpesa is not adopted by customers where there is high banking penetration • High banking penetration in South African market is a unique for an emerging market • Banks are the primary financial services provider for South African consumers • Banks in South Africa were quick to adopt digital technologies compared to other markets • Fintech companies in South Africa have not significantly grown because of Banks quick digital adoption • Banks sometimes offer superior digital products than local fintechs • Banks are well-regulated • Banks have developed credibility with local consumers • Customers know banks more than mobile fintechs	**Q2**	C.SEGM: BANKS LEAD ADOP.F: DIGITAL BANKS ADOP.F: COLLABORATION	• Refers to the characteristics of banking in South Africa (current use, consumer perceptions, level of penetration).	• Bank monopoly

• Customers are satisfied enough with current banking experience not to consider non-bank fintechs • Banks have incorporated customer needs into their new digital offerings • Fintech disruption was disintermediated by banks early on by acquiring them into bank • Fintech innovations developed outside of banks did not initially yield good results • Customers that switch to use mobile fintech apps as an alternative to Banks contend with multiple fintech apps for many uses • South African consumers access digital payments through traditional banks • South African financial services is likely to integrate fintechs and Banks • Fintech companies and Banks will likely have an ecosystem collaboration approach in the future • Fintech products in the future will be incorporated into Banking, but banks will own the customer relationship • Customers are familiar with Banks which is a barrier to adopting non-bank fintech				

Consumer needs • High customer adoption is dependent on the extent the product solves customer problem • Customer need is convenience • Customer need is quality • Consumer need for fintech is low due to high banking penetration • Payments has highest customer adoption due to meeting primary consumer payment need • Customer need for payment needs are already addressed • Customer need to borrow is a primary need after payments • Lending fintech are meeting convenience customer need • Customer need for insurance is influenced by affordability • Customer having disposable Income influences their need for an insurance product • Customer need for savings is influenced by affordability • Customers need for lending comes before insurance and savings • Customer needs are more important than product scalability • Customer needs are more important than HPE • Customer need for lending exists for middle income customer	**NEW**	ADOP.F: SPEED ADOP.F: CONSUMER NEEDS: SIMPLE ADOP: INCOME ACCESS	• Refers to the ways in which the fintech services currently meet local customer needs • Refers to the customer needs that fintechs have identified for local customers	• Latent customer needs

• Customer needs that aren't addressed will be addressed by fintech companies who can reach the customer first • Customer need identification depends on fintech entrepreneur understanding local customer needs • Customer needs that are met lowers adoption barriers • Customer adoption will happen across Income groups if products meets customer needs • Customer need for payments is consistent for everyone • Customer need for lending is intermittent • Customer need for savings depend on disposable income • Customers experience less convenience when managing multiple fintech aps • Customer need for lending is not well addressed by banks for lower income to lower middle income customers • Lower income customer need for lending can be met for by fintechs by offering easier credit alternatives • Lower income customer segment ability to pay back debt is low • Customer need for easy EE / ease of ease can be met by fintechs making onboarding simpler than Banks				

• Customer need for convenience is met through simpler customer onboarding on mobile fintech apps				
<u>Covid disruption as customer adoption facilitator</u> • Covid has accelerated customer adoption for digital products • Covid forced consumers to adopt digital alternatives • Consumer need for convenience has deepened due to Covid. • Covid has created price sensitivity in South African customers using financial services	**NEW**	ADOP.F: COVID ADOP.F: COVID.DIGITAL INCREASE C.SEGM: PRICE SENSITIVE	• Refers to the beneficial customer uptake that fintech companies experienced from the Covid-19 pandemic in South Africa	• New customer needs arise due to Covid impact
<u>Digital Persona customer behaviour</u> • Digital Natives adopt fintechs faster • Mobile fintechs are substitutes to banks • Digital natives have digital literacy to assess nuance's of digital products	**Q 4.1**	ADOP.F: D.NATIVES C.SEGM: D.IMMIGRANTS:SECONDARY	• Refers to the personas of digital natives and digital immigrants within the	• Digital Behavioural Integration Rules Over

• Digital immigrants are slower adopters than digital natives • Digital immigrants do adopt technologies if there is a unaddressed need • Customer needs are differentiated according to personas • Digital Natives take more risks for new digital products • Digital natives that are sophisticated do everything digitally • Digital natives do not have trust and credibility issues like digital immigrants **<u>Digitally transformed customer behaviour</u>:** • Consumer type influences the use of payment alternative like a non-bank fintech • Sophisticated customer segments use non-bank fintech payments • Digitally literate customer can differentiate value between non-bank fintech solution • Personas define what customer needs are bigger than other needs • Customer digital behaviour depends on personas • Customer digital behaviour could be conscientious behaviour or spend thrift type behaviour	**Q 4.4**	ADOP.F: EASE WITH DIGITAL ADOP.F: BEH. DIVERSITY C.SEGM: D.NATIVES :TRUST	customer landscape in the middle income market. • Refers to the markers of digitally transformed customer behaviour	Persona Segment • Consumer trust gained over long period e.g. digital natives • Diverse digital channel engagement

• Consumer with digitally transformed behaviour are early technology adopters • Consumer with digitally transformed behaviour owns a smart phone • Consumer with digitally transformed behaviour spends time online • Consumer with digitally transformed behaviour addresses many needs digitally • Consumer with digitally transformed behaviour does a variety a things online • Consumer with digitally transformed behaviour engages social media but their consumption happens online as well • Customer with digitally transformed behaviour is easier for fintech companies to acquire as customers • Customer with digitally transformed behaviour have less digital barriers • Customer with digitally transformed behaviour indicates sophistication • Customer digital literacy determines level of fintech engagement • Customers with fully adopted digital behaviour have multiple digital touchpoints at work, and at home • Customer digitally transformed behaviour engages digital in not only finances but social media, e-commerce, online shopping				

• Customers with positive digital experiences will have increased comfort with mobile fintech **<u>E-Commerce</u>** • China's high customer adoption of fintech is related to high ecommerce boom • Customers that are comfortable with e-commerce will be comfortable with adopting mobile fintech into their digital behaviour • Mobile fintech adoption is related to e-commerce • Customer expectations of speed and efficiency from e-commerce has transferred onto financial services	**Q 4.3**	ADOP.F: HIGH MOBILE USE ADOP.F: MI USE ECOMMERCE	• Describes online e-commerce behaviour as an indicator of digitally transformed behaviour for the middle income customer	• Consumer trust gained through e-commerce experience
<u>Customer usage/habits of mobile fintech</u> • Customer Usage of technology is influenced by affordability and disposable income	**NEW**	ADOP.B: LOW INCOME	• Refers to the reasons behind a lack of customer usage of mobile fintech	• Under-stimulated Customer Adoption

<u>Cash use in middle income group who use mobile fintech</u> • Digital immigrants trust cash – not all of them • Digital immigrants might prefer non-digital customer engagement • Lower income customer segment is in the cash based economy • Customers withdraw • Cash use is pervasive in South Africa due to cultural reasons • Cash is pervasive in South Africa due to cultural reasons • Cash use is linked to social roles like the head of low income household physically handing out • Low income customers like social recipients withdraw all funds same day they receive it • Cash use is a problem that both banks and fintechs have not solved for customer market **<u>Risk:</u>** • Risk is important in the absence of security and trust	**4.2**	ADOP.B: CASH C.SEGM: CASH TRADITIONS	• Refers to the factors behind continued use of cash for the middle income market customer	• Cash Economy *Not categorized*

III. ***Theme Extraction from Categories***

Categories: Inside Fintech (x19)	**Categories: Outside Fintech (x 21)**	**Extracted Themes (x4)**
Income as influencer		
Income as access point to adoption Sub-Category: Financial Enablement		*External Enablement*
Engagement is across income segments		
Middle Income Market Characteristics		
Internal Customer Needs		*Customer Needs*
	External Customer Needs	*External Enablement*
Customer Segments in fintech		
Customer Identity Disunity		*Inclusive Marketing Innovation*
	Customer Usage Disunity	
Facilitators to customer adoption		
Phone Quality Sub-Category: Phone quality determines customer journey	Phone Access	*External Enablement*
	Latent Customer Needs	*Customer Needs*
Fintech product value as facilitator to customer adoption		
Under-stimulated Customer Adoption Sub-Category: Undersold product value		*Inclusive Marketing Innovation*
Barriers to mobile fintech adoption		
	Socio-economic barriers to customer adoption	*External Enablement*
Fintech segments in South Africa		
Customers need Financial Services Sub-Category: Bank monopoly blinds customers to see fintech value	Inclusive Innovation Product Design	*Inclusive Marketing Innovation*
Trust as barrier to mobile fintech adoption		
Trust as customer protection		*Sub-Theme 2: Trust*
Banks		
Bank monopoly		*Digital Ecosystem*
Customer needs		
Latent customer needs *(duplicate category)*		*Customer Needs*
Covid disruption as customer adoption facilitator		
New customer needs arise due to Covid-19 impact		*Digital Ecosystem*

Digital Persona customer behaviour		
Digital Behavioural Integration Rules Over Persona Segment		*Sub-Theme 1: Digital Behaviour*
Digitally transformed customer behaviour:		
Consumer trust gained over long period e.g. digital natives		*Sub-Theme 2: Trust*
	Diverse digital channel engagement	*Sub-Theme 3: Product Value*
E-Commerce:		
Consumer trust gained through e-commerce experience		*Sub-Theme 1: Digital Behaviour*
Customer usage/habits of mobile fintech:		
Under-stimulated Customer Adoption *(duplicate category)*		*Collapsed with inclusive marketing innovation*
Cash use in middle income group who use mobile fintech:		
Cash economy		*Collapsed with digital ecosystem*

IV. ***Coding Labels Definitions Table***

Code Label		Definition
C.SEGM:	**Customer Segment**	Pertains to the characteristics, attributes for the South African middle income market customer segment.
F.SEGM:	**Fintech Segment**	Pertains to the industry characteristics, factors for the South African fintech segments.
ADOP.F:	**Adoption Facilitator**	Pertains to the positive factors that influence the customer adoption of mobile fintech in the South African middle income market.
ADOP.B:	**Adoption Barrier**	Pertains to the negative factors that influence the customer adoption of mobile fintech in the South African middle income market.

V.

CODING TREE DEVELOPMENT TABLE							
C.SEGM: (charac-teristics)	**ADOP.F: Stimulants of Growth (1/2)**	**ADOP.F: Stimulants of Growth (2/2)**	**ADOP.F: External Customer Enablers**	**ADOP.F: Internal Customer Enablers**	**ADOP.B: High Barriers**	**ADOP.B: Low Barriers**	**F.SEGM: (charac-teristics)**
C.SEGM: DEMOG	ADOP.F: MI USE FINTECH	ADOP.F: HPE	ADOP: INCOME ACCESS	ADOP.F: MI APPEARANCE	ADOP.B: MI SKEPTISM	ADOP.B: DIFF. DIGITAL NEEDS	F.SEGM: CRYPTO GLOBAL
C.SEGM: DIFF. NEEDS	ADOP.F: MI USE BANKS	ADOP.F: SI	ADOP.F: EDUCATION	ADOP.F: D.NATIVES	ADOP.B: LOW FINANCIAL LIT.	ADOP.B: UNEQUAL USE IN SEGMENTS	F.SEGM: BANKS LEAD
C.SEGM: PRICE SENSITIVE	ADOP: USSD FOR LM INCOME	ADOP.F: EE	ADOP.F: DIGITAL BANKS	ADOP.F: D.NATIVES	ADOP.B: LOW USAGE	ADOP.B: HIDDEN PRODUCT VALUE	F.SEGM: ESSENTIAL SERVICES
C.SEGM: LOW TRUST	ENGAGE: INCOME	ADOP.F: CUSTOMER JOURNEY	ADOP.F: COVID-19		ADOP.B: CASH	ADOP.B: IGNORANCE	F.SEGM: PAYMENTS LEAD
C.SEGM: MI LOW RISK	ADOP: APP FOR MI INCOME	ADOP.F: SPEED	ADOP.F: COVID.DIGITAL INCREASE		ADOP.B: DATA COSTS	ADOP.B: UNAWARE	F.SEGM: LENDING OPP

C.SEGM: BANKS LEAD C.SEGM: D.NATIVES: PRIMARY C.SEGM: D.NATIVES: TRUST C.SEGM: CASH TRADITIONS	ADOP.F: CUSTOMER JOURNEY ADOP.F: MI USE ECOMMERCE ADOP.F: MOBILE USE ADOP.F: TARGET MARKETING ADOP.F: CAPTURE CUSTOMER ADOP.F: BEH. DIVERSITY	ADOP.F: DESIGN ADOP.F: CONSUMER NEEDS ADOP.F: CONSUMER NEEDS: SIMPLE ADOP.F: EASE WITH DIGITAL ADOP.F: UPE/NEEDS ADOP.F: SI / NETWORKS	ADOP.F: COLLABORATION		ADOP.B: PHONE MODEL ADOP.B: TRUST ACCESS: PHONE ACCESS ADOP.B: DIGITAL LITERACY ADOP.B: LOW INCOME	ADOP.B: LOW LOCAL INNOVATION ADOP.B: DATA/NETWORK	F.SEGM: LOW CUSTOMER ADOP.