

**The Growth of Digitization of Retail Banking in Ireland, and the  
impact FinTechs' have on the adoption and actual usage**

Patrick Keogh

Dissertation submitted in partial fulfilment of the requirements for the degree of  
Masters of Business Administration  
at Dublin Business School



Supervisor: Enda Murphy

September 2021

## Declaration

I declare that this dissertation that I have submitted to Dublin Business School for the award of Master's in Business Administration (MBA is the result of my own investigations, except where otherwise stated, where it is clearly acknowledged by references. Furthermore, this work has not been submitted for any other degree.'



---

Signed: Patrick Keogh

Student Number: 10541311

Date:27/09/21

## Acknowledgment

I would like to acknowledge the support I received from my family while working on this dissertation. My wife Laura whose guidance and encouragement has got me through the last few months. I would also like to acknowledge the support of all the faculty from Dublin Business School who I have learned so much from.

## Table of Contents

Declaration.....	1
Acknowledgment .....	2
Abstract.....	5
Introduction .....	6
Rational .....	6
Key concepts .....	8
Introduction and Literature review .....	9
Gap in Knowledge .....	10
Digitisation of Customer interaction and the rise of FinTech’s .....	12
Irish Market.....	14
Technology Acceptance Model (TAM).....	18
Limitations of TAM.....	21
Behavioural Economics (BE).....	22
Nudging.....	23
Digital Nudging.....	25
Social Norms .....	25
User Design (UI) .....	26
Perceived Risk .....	27
Instant Mobile.....	27
Behavioural Economics (BE) Conclusion .....	28
Methodology.....	29
Introduction.....	29
Data Collection .....	30
Design .....	31
Section One.....	32
Section Two.....	36
Section Three .....	37
Framework .....	39
Data Analysis .....	40
Ethics .....	43
Hypothesis.....	43
Results.....	47

Descriptive Statistics .....	47
Test for Normality. ....	49
Non-parametric statistics .....	52
Inferential statistics .....	53
Age analysis.....	53
Gender Analysis .....	64
FinTech Analysis .....	69
When Bank account was opened analysis .....	76
How a Bank account was opened analysis.....	82
Discussion.....	89
Summary of Findings.....	89
Findings for Fintech.....	92
Other Findings .....	92
Limitation of the research .....	94
Recommendations for Industry .....	95
Final considerations .....	96
Bibliography .....	97
Appendix I Questionnaire .....	106

## Abstract

The Digitisation of the banking industry has been with us for some time, but the influence of new technologies and Fintech providers has ramped up the changing of the engagement channels between financial institutions and their clients. This paper examines the changing environment and the impacts up the actual usage and adoption of digital platform. It will also look to establish the impact FinTech's are having on this change in the context of a rapidly changing Irish retails financial sector. Financial Acceptance Model & the Behavioural Economics theory of Nudging are used in a framework that will to be used to evaluate how demographics and baking variables affect digital banking actual usage and adoption.

## Introduction

The research question that was the focus of this study was the Growth of Digitization of Retail Banking in Ireland, and the impact FinTechs' have on the adoption and actual usage.

This research examines the increases in online digital activity in the retail banking sector in Ireland. It will look at factors that impact upon the adoption and actual usage of Digital banking with a focus on retail activity i.e. bank accounts and payment services

The research centres on Irish residents over the age of 18 years that have either a bank account and/or payment service account with one of the regulated Irish retail banks or possess an online Bank account or payment provider that offers service to Irish residents. The aim of this research is to identify the actual usage and adoption of digital banking across a number of demographic areas with a focus on variances between Traditional Bank and Financial Technology (FinTech) consumers. It will identify these differences using the constructs of the Technology Acceptance Model (TAM) and the behaviour economic theory of Nudging.

## Rational

The digitisation of communication channels across industry has changed the customer engagement experience and corresponding behaviours. The retail banking sector has experienced this change more than most with new technologies changing engagement models, internal processes being re-engineered and new entrants moving to compete with Banks.

Over the last decade FinTech firms have expanded their product offering to directly compete with the traditional banks and they have some distinct advantages: more flexibility,

international trading capabilities/synergies across markets, lower cost base and ability to cherry pick where to compete. In addition, they do not have the same exposure to legacy assets that traditional banks have. The growth of FinTech is a threat to the profitability of traditional banks, while also providing a challenge to financial regulators. Berger (2015) found that 20-30% of banking revenues are at risk to FinTech competitors. Key segments of the market identified to be under threat are payments, lending, investments, and aggregators (Berger, 2015).

Banks and FinTech are competing for customers of digital platforms and this research will look to identify if there is any difference in the perception of the respondents to each offering. The financial sector has gone through a contraction, initially after the financial crisis in 2008 and more recently with two major retail banks, Ulster Bank and KBC announcing their exit from the sector. This leaves a concentrated marketplace with competition to the incumbent bank primarily coming from the FinTech sector. With FinTech's being heavily dependent on consumers adopting the digital agenda the future direction and speed of change will be impacted by consumers adopting and using digital banking channels. By determining the actual usage and adoption of fintech banking it will provide insights into how the industry will continue to develop, establish the appetite of consumers to move away from traditional channels across demographics and establish the impact Fintech have had on the behaviours of the consumers.

## Key concepts

For the purpose of this research project, key terminology is defined below.

FinTech is defined as an industry composed of companies that use technology to make financial services more efficient (McAuley, 2014).

Traditional Banks are defined as financial Institutions with a physical infrastructure supporting retail banking activity offered directly to consumers.

Digital banking is defined as the conducting of transactions and accessing bank account information electronically via personal computers (PC) (Shaikh *et al.*, 2017).

A bank account is a financial account maintained by a bank or other financial institution in which the financial transactions between the bank and a customer are recorded (FCA Handbook, 2021a).

Payment Services enabling the movement of electronic payments through an online internet-based platform (FCA Handbook, 2021b)

Nudging in this context is a term that stems from Behaviour Economics, it's the action of using a selection framework that encourages people to make a preferred selection that's on the face of it is in the persons best interest (Thaler & Sunstein, 2009).

Actual Usage is determined by perceived ease of use, Perceived usefulness, Attitude, Behavioural intention, Digital Banking self-efficacy & Subjective Norm as set out in the TAM model. (Scot *et al.*, 2019)

## Introduction and Literature review

The Banking Industry and specifically how the banks engage with their clients has gone through an overhaul in the last two decades. The revolution is being driven by the mobile devices and the digitalisation of the technology (Laukkanen, 2007). The cost saving benefits the internet has brought to the banking sector was the initial catalyst for Banks changing their consumer engagement models (Jolly, 2016). Consolidating physical branch networks and incentivising non face to face interactions was the strategy employed by most banks. (Kaur *et al.*, 2016)

This was later followed by competitive pressures stemming from technology digitisation and the wave of new entrants (Vives, 2019). This new competition originated out of technology firms providing payment solutions. The changes that have been implemented on the back of this disruption overhauled the client engagement model, customers no longer needed to physically call to a bank branch or speak to anyone to carry out any of their banking activity (Lee *et al.*, 2003). Technology enhancement has had considerable impact on customer engagement from how customers interface with banks and the marketing engagement strategies of the bank (Dootson *et al.*, 2016).

Previous studies have looked at the adoption of mobile banking by new customers, focusing on customers going through the account opening process as the primary source data. (Zhou, 2012) With another study looking at clients post implementation provided from the banking institutions (Kang *et al.*, 2012). More recent studies have looked at the at differences in the online banking behaviours of different segments of the market (Hussian & Wong, 2015). The perceived risk associated with digital and mobile technology are intrinsically linked to its

adoption. To build the initial trust in the tools self-efficiency, service quality structural assurance has a bearing (Zhou, 2012).

In the Irish context I found that limited research exists in the area of digital banking adoption, one study looks at the barriers to increase adoption of internet banking in Ireland focusing on employees of banks rather than consumers (Scatolin, 2018). The study by Scatolin (2018) found there was not a slowdown in the adoption of digital banking in Ireland.

Digitisation of platforms and its acceptance by customers is critical for banks looking to create a sustainable competitive business that can retain customers as well as attract new ones. Younger customers and generation Y have been shown to prefer digital banking platforms (Hussian & Wong, 2015). In addition, the research also highlights that this generation have a favourable attitude towards using FinTech providers with high scores in relation to the perceived usefulness and perceived ease of use of digital technology (Jiwasiddi *et al.*, 2019).

The latest catalyst for change has stemmed the Covid 19 pandemic which has seen consumer behaviour across all commercial activity being revolutionised. The transformation has had the effect of accelerating the growth of the use of digital banking platforms. FinTech firms are leading the way in this growth with a 72% increase in app usage observed around Europe in the first 6 months of the pandemic (Moşteanu *et al.*, 2020).

### Gap in Knowledge

As the FinTech industry has developed, research has predominately focused on how information technology is applied to financial services to allow for growth to meet the increased demand for application usage. Additionally, there have been studies analysing the

influencing factors behind the adoption of FinTech services. (Hussian & Wong, 2015; Gabor & Brooks, 2017). Some of these have leveraged the Technology Acceptance Model (TAM) to assess the consumer desire for using FinTech firms (Glas & Truszel, 2016; Ghani *et al.*, 2017).

Based on my research there has been no studies looking at potential differentials in demographic acceptance in the Irish market of FinTech and the perceived advantage these providers have over traditional banks. This novel research project examines variance in digitisation adoption across several demographic and other independent variables that will provide insight into the how the Irish market has been impacted by digitisation. The research analyses key behavioural influences that impact on Irish consumers when selecting their service provider for their digital banking needs.

This research studies the association between banking users and their adoption of digital technology for retail banking activity. This research analysis also studies the impact that FinTech has had on the adoption and digital services. The published research examined the adoption of FinTech or digitalisation adoption in isolation.

The conceptual analysis aim of this research is to investigate if there are different adoption and user acceptance for FinTech digital banking users versus non-users. The other unique aspect of the research is the focus on Irish residents, based on my literature review no such studies have been performed previously. The paper applies the TAM models and consider additional factors influencing the users' adoption. Distinctively the paper also analyses influences from behavioural economies that play a role in the decision-making process of users in adopting their banking provider (Zavolokina *et al.*, 2016).

## Digitisation of Customer interaction and the rise of FinTech's

The term digitalization is used by media, science, and business communities to describe a “process of moving to a digital business” (Gartner, 2021). The digitalization process is the migration from traditional physical channels and moving to digital business (Gartner, 2021). The banking sector is an industry that has identified digitisation as a key target deliverable for some time (Cziesla 2014; Graupner *et al.*, 2015). The traditional bank has been categorised as entities regulated for the purpose of providing payment and bank account services to consumers in Ireland with a physical premises that supports face to face customer engagement. Traditional banks will therefore include Credit Unions and the Post Office for the purpose of the study.

The traditional banking sector is being challenged on an increasing basis by technology firms diversifying into banking services and FinTech's are moving to compete more broadly with traditional banks (Alt *et al.*, 2018). While technology companies first started to encroach into the area traditionally serviced by banks as far back as the late 1990's the Banking Sector didn't see this as a real threat to their client base or bottom line and in most cases the responses were disjointed (Buss, *et al.*, 2016). The next wave of change into the financial space came from the already established technology and manufacturing firms most notably Apple, eBay, PayPal, Samsung, and Google offering some level of banking products. These firms primarily focused on delivering payment solutions for customers to buy goods or services from them and not a broad offering, however this changed with PayPal being spun off from eBay to offer its services across industry and consumers. Traditional banks responded by building out their own online platforms to support online payments and give customers access to bank account statements. While the industry was initially slow to react, the

competitive pressures forced it to adapt much faster in terms of product offering, process design and client interaction.

More recently things have changed with significant disruption to the banking industry over the last ten years from online service providers (Buss, *et al.*, 2016). The newer competitors have moved on from just offering money transfer/online payments and have progressed to cross product digitised competition developing out of the FinTech industry (Broeders & Khanna, 2015; Grebe *et al.*, 2016a). Over the last number of years these firms have shifted focus from offering services that compete directly with Banks, mostly offering a faster, more dynamic, and cheaper products. They avoided moving into areas that would expose them to banking regulations and their focus was on supporting their existing product offering (Van Der Zande, 2018).

Financial technology has been identified by many as a key threat to the current financial services model and some see it has had the capability to redesign one of the largest industries in the world. Key to analysing this potential threat will be understanding the customers' acceptance of their service offering and how they are viewed in comparison to the more established Banking providers (Grebe *et al.*, 2016b).

Banks offering a wide range of services, were used to competing against one another and adapting to moves from their direct competitors. However, the industry was slow to react to the threat from the technology sector (Broeders & Khanna, 2015; Grebe *et al.*, 2016a; Schmidt, Drews, and Schirmer, 2016). In the last six years, many new entrants have started to develop products that are designed to directly compete with and disrupt the Banking sector. These new entrants tend to focus on a niche product offering but deliver across jurisdictions on a global scale creating synergies and keeping costs low. Banks generally offer a one stop

shop for consumers offering a range of products (i.e. deposit, payment, and lending). FinTech companies are focused on offering better customer experience to small niche product segments (Hu *et al.*, 2019).

The banking sector has responded by investing in digital solutions and buying up FinTech competitors. However, due to legacy systems and products on their books they are not as dynamic or focused as the new entrants (Glas & Truszel, 2016). The relationship between traditional banks and FinTech is seen as a hostile one, which has escalated as FinTechs offer direct alternatives and substitute products to that of the banks (Barba and Macheel, 2016). Investment in these firms has also increased massively and by the end of 2016 FinTech investment reached \$23.2 billion (Gabor & Brooks, 2017). FinTech's existence is dependent on provision of enhanced user experience and higher efficiencies over traditional banks (Zavolokina *et al.*, 2016).

The most recent move from the FinTech industry has seen these institutions move to become regulated entities. The two most successful of these in an Irish market context are to Bank GmbH a fully licensed German Bank that exclusively offers its banking services through its Web and App based platforms and Revolut which has a Lithuanian Banking Licence and is regulated for electronic money transfers in the UK and Ireland.

## Irish Market

The last 10 years has seen significant contraction in the number of retail Banks operating in the Irish market. In the initial aftermath of the crisis the Irish owned banks were nationalised and were consolidated into three banks: AIB, Bank of Ireland and Permanent TSB. Several other institutions such as Danska Bank, Rabobank and Bank of Scotland exited the Market. This left only a handful of institutions offering retail banking to consumers. Then in

April of 2021 came two announcements in quick succession that that Ulster Bank and KBC Ireland will exit the Irish market. With just small number of players remaining offering ever increasing charges and a comparatively unfavourable regulatory environment for retail banks (Money Guide Ireland, 2021)

Ireland has become a target for a number FinTech providers. Ireland has a high level of daily internet usage, 83% (Eurostat, 2019) and has a high level of trust in making online payments, with only 4% of people not shopping online in the last year due to security concerns (Eurostat, 2019). In addition Irish consumers has increased the rate of mobile banking usage in recent years and as of 2020 the rate of banking activity performed online was 67% (Eurostat, 2020) taking it above the EU average (Figure 1)

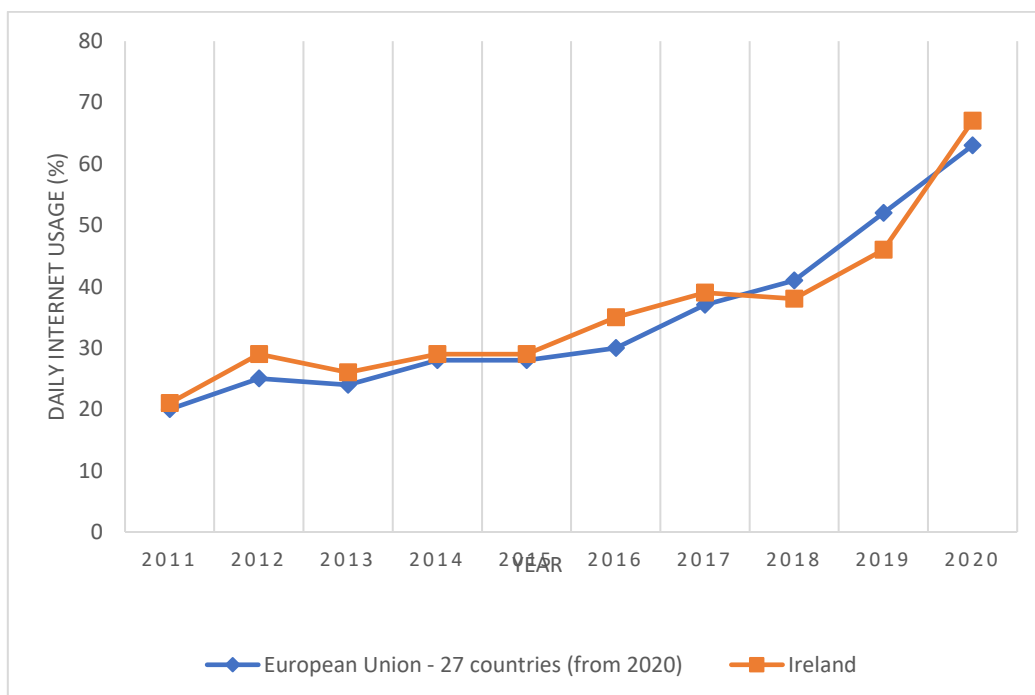


Figure 1 *Mobile Internet Banking usage in Ireland and EU; 2011 – 2020* (Eurostat, 2020)

The two notable FinTech's that have moved in to are Revolut who have 1.3 million Irish customers and N26 with 200,000 Irish customers (Keane, 2021). Adrienne Gormley, the chief operating officer at Germany's N26, which is a fully regulated bank itself, is cognisant of the drastically altered market. "Number one we view it as an opportunity. While the Ulster Bank news was probably on the cards for some time, I think people were taken by surprise at the KBC announcement," she told CNBC (Keane, 2021)

The digital agenda is already having an impact with both major banks AIB and Bank of Ireland announcing further branch closures in 2021. Offering a digital banking platform is a key priority for Irish banks but as it stands, they seem to be at a disadvantage to FinTech's in terms of regulatory requirements and product offerings. To counter the threat from FinTech the Irish retail banks have acted by making an application to the Competition and Consumer Protection Commission to allow them to collaborate on an instant payment application. Project Sync aims to allow for instant payments to be made between Irish bank accounts, this is something already available in other EU countries using IBAN's.

In the Irish market there is a high level of acceptance of digital banking. With the advancement and greater availability of technology assisting the increase of internet banking usage in Ireland (Scatolin, 2018). This research project looks at how this change has impacted the decision making of Irish banking consumers and identify what are the key decision drivers when selecting a Bank account and a payments service provider.

Pre Covid 19 pandemic segments of Irish banking consumers still used traditional bank branch engagement channels. Banking digitization and the move to support banking online products through online platforms has been ongoing for two decades. Since Covid two thirds of Irish consumers say they trust digital banks (Taylor, 2021). In Ireland the users of FinTech

and such as Revolut and N26 are thought to skew young, and this is something this research will investigate.

While there have been moves in recent year by the central bank to make it easier for consumer to switch banks with the development of the central switcher code the rate of switch remains extremely low, less than 1% in 2018 (Central bank of Ireland, 2019). New technologies allow for easier customer channel switching opportunities (Verhoef *et al.*, 2007) and with the cost of digital banking being low, it would be expected there would be a migration of customers to institutions and offerings with the lowest associated costs. While the rate of switching remains low FinTech has grown and are seen as offering supplementary services in the first instance with a strategy of growing their product offering to the customer over time. The pricing strategies of both Revolut and N26 has not gone unnoticed either with traditional banks brining in new tariff structure to counter the threat.

Darragh Cassidy of independent price comparison and switching site Bonkers.ie said he broadly welcomes these changes as he believes that the traditional banks are starting to feel the heat from online banking platforms like Revolut and N26, which charge almost no fees whatsoever. Starling Bank, another digital, mobile-only bank based in London, is also planning to enter the Irish. "Up until today," says Cassidy, "BOI's fee structure, along with AIB's, was particularly poor value. And as more and more of us have moved to card payments over cash due to Covid-19, continuing to charge individually for services like contactless payments was always going to be difficult for banks to do as the optics look so poor. There was rightly uproar when AIB tried to introduce a 1 cent fee for contactless earlier in the year." (Hearne, 2020).

## Technology Acceptance Model (TAM)

For the primary investigative framework this study utilises the empirically tested and widely used Technology Acceptance Model (TAM). TAM is a modelling tool used to predict users' acceptance of technology and predict future adoption. Developed in 1986 by Davis, TAM operated on the premise the acceptance of technology could be predicted using two key variables: Perceived Usefulness and Perceived Ease of Use (Figure 1) (Davies, 1986). Since its inception it has developed and been modified for use in research to include additional external variables and emphasis (Venkatesh & Davis, 2000). While there are several different variations, TAM has developed into the most extensively used modelling tool for technology usage (Lee *et al.*, 2003).

TAM is a recognized as being capable of identifying and predicting user behaviour when engaging with technology (Legris, *et al.*, 2003). Due to TAM being adaptable and enhanced for the given analytical problem and its ability to break out the users' different variables that impact usage, it is the most commonly used model for dealing with technology adoption (Zhang *et al.*, 2018). As the TAM model developed and expanded new variables were included regarding social influences such as perception of complexity and subjective norms. The new model became known as TAM 2 and has been tested extensively tested (Venkatesh & Davis, 2000). The extended model uses longitudinal data across four different systems and found that social (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) significantly influenced user acceptance. The TAM 2 model is the framework that is utilised in this research.

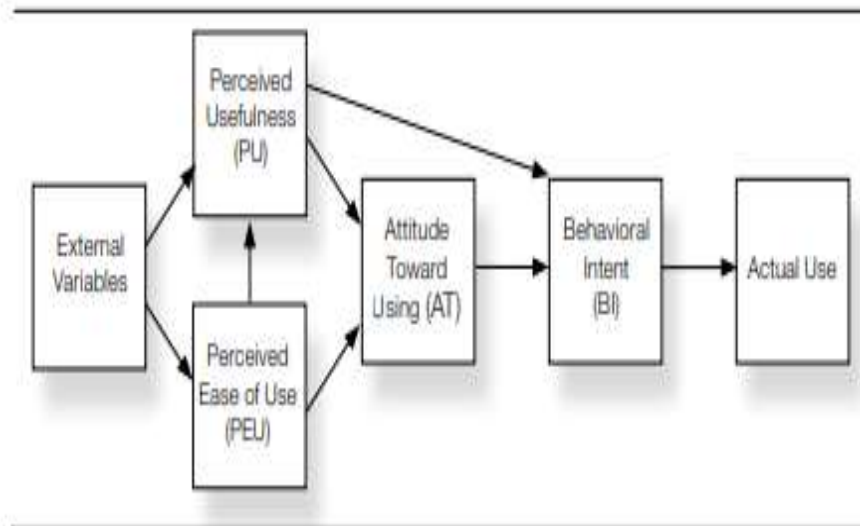


Figure 2 Original Technology acceptance Model (Davies 1989)

TAM has evolved so the emphasis on psychological variables have become more prominent. The literature shows cognitive style demographics and self-efficacy have varying levels of impact on user technology acceptance (Alavi & Joachimsthaler, 1992). The framework utilised for the purpose of this research is adopting the variables used by Park (2009) as these were deemed most aligned to the requirements of the banking sector. The TAM variables and definitions are outlined in Table 1 were mapped directly to the question contained in the survey of this research study.

Table 1 *Definitions of Technology Acceptance Model (TAM) Variables*

<b>Variables</b>	<b>Definition</b>
<b>Perceived ease of use (PE)</b>	A Persons point of view that utilizing a technology framework will be effortless
<b>Perceived usefulness (PU)</b>	A Persons point of view that utilizing a technology framework will improve their performance
<b>Attitude (AT)</b>	A Persons evaluative decision of the object behaviour on a certain dimension
<b>Behavioural intention (BI)</b>	A person's inspiration or intention to apply an effort to carry out the objective behaviour
<b>Digital Banking self-efficacy (SE)</b>	Measures one's confidence in mastering a new technology (Compeau & Higgings, 1995)
<b>Subjective norm (SN)</b>	A person's point of view of the degree to which significant people favour or are not in favour of the objective behaviour

The definitions of each of the TAM variables utilised in this study in this study (adopted from Malatji *et al.*, 2020; Compeau & Higgings, 1995).

Some researchers have evaluated the digitalisation of the banking industry and the impact of TAM (Faccia *et al.*, 2020). Applications developed for mobile phones and tablets as well as online access through personal computers and laptops are considered part of the digitisation. Mobile banking can be considered as an extension of the online banking, since it is referred to as the access to banking services through mobile phones, smartphones, or electronic tablets, as well as more traditional laptop or a desktop computer channels (Fang,2010).

The existing research also distinguishes between Banks that have physical branches and those that don't yet have banking services entirely online (Moşteanu *et al.*, 2020). TAM is the pre-eminently used model used in academia to evaluate adoption of digital banking and this the reason for its selection in this study.

Arguments have been made that theoretical framework around the ease of use and usefulness, despite their common usage in research and across academia, are not robust

enough on their own to assess adoption of technologies (Luarn & Lin, 2005). With greater emphasis on unparalleled and unreasoned action (De Guinea & Markus, 2009). Applying the approaches of Behavioural Economics (BE) and nudging to examining behaviour helps fill the gap in the financial services market literature (Wijland *et al.*, 2015).

### Limitations of TAM

Despite the popularity of TAM, literature points to some limitations of the model. The strength of TAM in terms simplicity and flexibility has also led to numerous competing variations of the models creating a level of uncertainty amongst the research community (Benbasat & Barki, 2007). Another limitation is that underlying behaviour cannot be reliably quantified in an empirical investigation, owing to a number of different subjective factors such as the norms and values of societies and personal attributes and personality traits. (Ajibade, 2018)

Another area TAM has come in for criticism is in how it assesses the behavioural influences of users'. Evidence from the literature indicates that TAM was not able to provide comprehensive precursors to mobile use, or able to factor in social influence and conditions that facilitate behaviour (Napitupulu, 2017; Torres, & Gerhart, 2017). TAM is not robust enough to explain user's behaviour regarding buying, rejecting or accepting of technology use (Hai & Alam Kazmi, 2015). While TAM is limited in terms of factoring interpersonal relations into Behavioural Influence (BI). This is captured to an extent under Subjective Norm (SN) when a person is influenced by words of mouth from a colleague, or a friend (Maruping, *et al.*, 2017).

## Behavioural Economics (BE)

With some of the limitations of TAM focusing on the lack or emphasis placed on the behaviour of users and impact of social environment this research will look to mitigate these limitations by also looking at how these behavioural elements also impact of the technology take up and usage.

Behavioural Economics (BE) can be traced back to the work of psychologists Daniel Kahneman and Amos Tversky in developing prospect theory. Prospect theory deduces that individuals feel differently about gains and losses, feeling the impact of losses far greater than gains. The theory proposes people are loss averse and feel the impact of losses greater than that of gains. This in turn impacts on decision making as people are risk averse. (Kahneman & Tversky, 1979).

The theory of nudging is developed in the works of Kahneman & Tversky (1979) as they examine how it shifts emphasis from how people evaluate risk when making decisions, to concentrating on identifying how heuristics impact behaviour and what strategies can be used to influence people. Nudging theory was developed by Richard Thaler & Cass R Sunstein. Nobel prize winner Thaler researched the impact BE has on people's decision-making process and how that can diverge from the traditional economist view (Thaler, 2015). When announcing Thaler with the Nobel prize the Nobel committee outlined why

“Richard Thaler's contributions have built a bridge between the economic and psychological analyses of individual decision-making. His empirical findings and theoretical insights have been instrumental in creating the new and rapidly expanding field of behavioural economics, which has had a profound impact on many areas of economic research and policy” (Nobel Prize, 2017)

This research explores Behavioural Economics impact on the decision-making process of people when selecting financial providers focusing specifically the role of Nudging. The traditional economist view is that people will make the decision that are in their best interests and when it comes to decisions relating to individuals finance the selection would be made on what made most economic sense. Utility theory (Fishburn, 1976) being the basis of economic thinking on decision making assumes the people are always rational. BE distinguishes between Humans and Econs as a way of moving away from the rigid economics modelling that assumes consumers always make a rational decision and weigh up cost benefit analysis for each decision (Thaler, 2015; Niederjohn & Kim 2019). Humans on the other hand are influenced by emotion and bias, and therefore do not always make the decisions that will provide them with the optimal outcome (Thaler, 2015; Niederjohn & Kim 2019).

### Nudging

Nudged theory proposes people's decisions and behaviours can be influenced by how information is presented or framed. When looking at people's decision-making pattern Thaler and Sunstein 2009 offer an alternative view on why people make decisions that impact their financial wellbeing (Thaler & Sustein, 2009). The power of nudging and how it can influence behaviours is famously summed up by the ceramic painted on fly that appeared in bathrooms urinals in Schiphol Airport. The small change was able to change the aim of heavier users of the urinals and reduce spillage by 50% and having the knock-on effect of reducing cleaning cost by 20% according to Sphinx, the urinal manufacturer (Evans-Pritchard, 2013)

Thaler summed it up in an interview with NPR radio: The fly in the urinal that was used in the Amsterdam airport - they etched this image of a housefly right in the urinal. So, the idea is if you give a man a target, he will aim. And they claim - we've been unable to check

this data. But they claim that spillage, which is a great euphemism - that spillage was decreased significantly (NPR, 2021)

For something to be classified as a nudge “the invitation needs to be easy and cheap to avoid” (Thaler & Sunstein, 2008, p6). Nudges have been shown to influence customers in their decision-making process (Martin *et al.*, 2012). In my review of the literature, nudging has been analysed across a number of sectors including politics, consumer behaviour financial services, public health and technology. Google are known to use nudging in their workplace environment with a focus of keeping staff content and provide a happy work environment (Cai, 2019). David Cameron set up a nudging unit in the UK looking at health care decisions (Thaler & Sunstein, 2009). Which was extended to include influence decisions making to improve public health (Ensor *et al.*, 2013).

While there has been considerable research done into behavioural economics impact in the financial markets and on finance decisions there is a scarcity of research in relation to nudging’s impact on decisions being made in the financial sector. When looking at designing a nudge to produce a particular response you need to put in place a framework or “choice architecture” you should use a wide range of tools such as default options, question framing, incentives etc (Thaler & Sunstein, 2008; Brown & Krishna 2004). When it comes to financial markets the literature focuses on two main two, the use of the default option which is now widely used in the pensions industry in the US market where employees will not normally be enrolled in a pension unless they take action and secondly to structure alternatives in a particular way that favour the preferred outcome.

## Digital Nudging

More recently there has been an emphasis on the potential for digital nudging particularly in the rapidly growing mobile technology market. Benartzi (2017) Digital nudging has been described 'the use of user interface design elements to guide people's behaviour in digital choice environments' (Weinmann *et al.*, 2016). Traditional nudging theory is seen as being applicable in an offline environment. Digital Nudging is designed to address areas of online concern (Weinmann *et al.*, 2016) with the most relevant for this research being e-commerce.

According to Benartzi (2017) there are two main advantages of Digital Nudging: "First, the digital space allows us to conduct research much faster, as we test out multiple designs to see which one works best. Instead of waiting years to see if an intervention is effective, we can often get results in days or weeks. Second, the digital world offers unprecedented scale: by fixing a single website or app, we can potentially help millions of people make better financial decisions"

## Social Norms

Social norms have been defined as rules and standards that are understood by members of a group, that guide and/or constrain social behaviour without the force of law (Cialdini and Trost, 1998). Studies show the impact of social norms such as social influences and social comparisons have been shown to have an impact on the decision-making process of people (Bond *et al.*, 2012 Ayres *et al.*, 2013). While a few studies have shown there is no effect of social norms these are limited in number (Blumenthal *et al.*, 2001; Torgler, 2004).

This research looks at the impact of social norms such as the power of email outlined by Benartzi, (2017). The most effective email used in the study showed almost double

participation and enrolment in a saving programme (Beatriz, 2017). Due to the low-cost impact of email the study found the power of email to be 100 times more cost effective than other policy interventions tried in the past (Benartzi, 2017). The email invites from friends is a tool being used by digital banking providers most promptly in the Irish market by Revolut. This research will analyse the impact of these emails in comparison to other social influences that influence the choice of the respondents.

### User Design (UI)

User design impacts on choices made by people in a digital environment, it includes specific content or design features that impact on behaviour (Mirsch *et al.*, 2017). When people or a person make a decision cost is nearly always a contributing factor. It is not always easy to evaluate cost, mentally it's more difficult to appraise the cost of an item purchased on credit over one purchased with card due to the spread-out nature of the impact (Prelec & Lowenstein, 1998). This has been identified as decoupling (Thaler, 1999). An ever-increasing number of decisions are being made on screen and transacted through digital channels, with the overloading of information people do not always make the best decisions for them (Mirsch *et al.*, 2017).

One of the psychological effects documented that is impacted by digital nudging is mental accounting (Momsen & Stork, 2014). The power of mental accounting on screens will influence people's decision Benartzi (2017). FinTech and to a lesser extent traditional banks have developed easy option saving plans with some offering saving options based on rounding up prices with the rounded amount going into a savings account. Two areas of nudging Benartzi (2017) identified that have relevance in the digital banking sector are creating a single view of transactional and financial activity in one place and the visible

analytics offered by service providers that also allow for one click creation of saving and spending targets. This research will analyse these two variables to assess if they are perceived as important and their impacting on user behaviour.

### Perceived Risk

Perceived risk is defined as a function of uncertainty about the potential outcomes of a behaviour and the possible unpleasantness of these outcomes (Gensler, 2012). Researchers have shown there is an impact of perceived risk on the customer selection process (Chou *et al.*, 2016; De Keyser *et al.*, 2015). The use of internet channels has a high level of perceived risk in comparison to offline channels for customers (Verhoef *et al.*, 2007). This is particularly true in areas of where financial service products are concerned especially in financial services (Gensler, 2012).

Capturing the perceived risk in a framework will provide additional insights into the multi choice selection process for clients particularly when comparing online and offline option (Hummel *et al.*, 2017). This research will capture the perceived risks associated with digital banking platforms by assessing the importance placed on the perceived security of digital banking platforms and the perceived security of the funds being transferred. As people are risk averse assessing the impact of risk is important for predicting and understanding the adoption of new technologies (Kahneman & Tversky, 1979).

### Instant Mobile

To fully evaluate the perceived risk the choice and balance of decision between functionality and risk needs to be analysed. The great advantage for digital banking and online banking is the instantaneous completion of the process. The power of just in time mobile (Benartzi, 2017) allows people make better decisions when they have better access to

information. The ability to make payments instantly, send money to friend and family with just a phone number and to split bill are attractive to potential customers.

In banking, this is an area of ever-increasing competition from instant translation to better access to account spending and savings insights. Examining the data available in this area of competition Benartzi (2017) found having information available in an app has an enormous influence on users' behaviour, with a decrease in spending by 15.7% where data on discretionary spending was made available.

### Behavioural Economics (BE) Conclusion

Traditionally, economics views the human being as homo economicus, whose decision making is fundamentally rational (Mirsch *et al.*, 2017). Based on normative economic theories Irish people would migrate their banking and payments services to FinTech providers who are offering products to consumers with greater utility i.e. they are faster and cheaper. However as noted previously Irish users are reluctant to change banking providers. In this research the impact of nudging and how it currently influences the decision-making process for people when selecting Banking and financial services providers will be examined (Cai, 2019).

As Banks and FinTech continue their competition for customers, how nudging has impacted the decision-making process will be of interest to the sector. I will evaluate if Behavioural Economics and the Nudge Theory can influence the decision-making process of the participants using "Digital Nudging" case Benartzi (2017) as a framework.

## Methodology

### Introduction

The intention of this study was to analyse the key factors influencing the implementation of digital retail banking service in the Irish market and determine if there were different attitudes across varying demographics including a comparison between respondents that use FinTech service providers. The primary objective of this research study was to identify the level of actual usage & adoption of retail bank digitalisation in Ireland. This research also explored the impact of FinTech companies on the Irish market and what are the key influencing factors on consumers when selecting between the different bank offerings available.

The secondary objective of the study was to ascertain if there were any variance of usage of digital banking across different demographic groupings. In addition to demographic variance the study also examined differences in the perception of Traditional Bank and FinTech consumers. The perception of the digitisation of retail banking channels amongst consumers provides a clear indication of how far the market has progressed away from the traditional physical banking channels.

The research is important as the number of banks in the Irish market is shrinking, there is less choice and competition between the banking providers. FinTech are the only potential competitors on the horizon, and they are reliant on consumers using digital banking platforms channels. The acceptancy of these platforms and identifying what functionality is important to consumers as well as what they are influenced by when selecting a service provider will provide insight for market players.

From a methodological perspective, this study aims to combine two frameworks the TAM model which is long established, and peer reviewed with the digital nudging theory to establish how consumers adoption and actual usage of digital banking and understand if there is an impact on this from Fintech companies. This section details the methodology used in this research project. It outlines how the methodology used addresses the research question.

## Data Collection

Questionnaires have long been used as an important method of data gathering. They are an important data collection tool as they offer flexibility and provide a valid way of collecting quantitative data (e.g. opinions, attitudes, perceptions – that cannot be measured directly) and they allow for a large amount of data to be collected using consistent and relatively inexpensive methods (Dawson 2017).

This research study utilised the quantitative research method to collect primary quantitative data i.e. the respondents opinions on key influencing factors when choosing different bank offerings and analysed the relationships between demographic variables such as age and gender and the TAM model and Nudging Theory. The TAM and Nudging frameworks previously outlined form the basis of the empirical data that has been collected.

This questionnaire was prepared using the web portal google forms and distributed to participants using social media, text message and business network sites. Participants were requested to complete the survey using a link to the Google forms questionnaire. The questionnaire was self-administered by 161 adult participants resident in Ireland. The 161 responses were gathered as part of the study were done so anonymously with no personal

identifying information gathered as part of the process. There was no invalid response meaning all 161 respondents' data form part of the analysis.

One of the objectives when creating the questionnaire was to ensure it was easy to follow for respondents and to limit the time it would take for response to complete. To assist with this multiple-choice questions and Likert scales were used. The aim of which was to ensure range of respondents representing a cross section of people who use bank account and payment services account in Ireland.

## Design

The title of the questionnaire was "Factors influencing banking choices in a Digitized world". The questionnaire was divided into 3 sections as follows: Demographic and Product relevant information, Technology Acceptance Model (TAM) based questions and Behavioural and influence questions based on behavioural economics theory of nudging using Benartzi (2017) studies as a framework. There was a total of 31 question in the survey broken out into three sections: eight questions in section one, fifteen questions in section two and eight questions in section three.

Within the questionnaire bank account and payment service were defined, as there are a number of questions within the survey that required these to be distinguishable. The definitions provided were:

- "A bank account is a financial account maintained by a bank or other financial institution in which the financial transactions between the bank and a customer are recorded"
- "Payment Services enabling the movement of electronic payments"

In addition, there was guidance provided that was captured by the term Digital banking.

- “For the purposes of this document, "Digital Banking" is intended to refer to Day to day Banking activities via a Current Account - payments, transfers, cash Standing Orders, Direct Debits across all online and digital platforms”

## Section One

The first section of the questionnaire was designed to gather demographic data as well as corresponding data relating to the banks and the banking services the respondents use. The demographic data was used to identify if there were differences in adoption and or actual usage to banking digitisation amongst any subsection of the of the Irish markets e.g. does the age bracket of the respondents vary relative to any of the key response data.

The demographic variables are independent variables. An independent variable is a variable that is being manipulated or changed to measure its impact on a dependent variable (Saunders *et al.* 2015). A direct variable changes in response to changes in other variables; observed outcome or result from manipulation of another variable (Saunders *et al.*, 2015). The demographic independent variables cause change in the dependant variables. The dependant variables in this research study were banks, FinTechs and service providers and the attitudes and behaviour of Irish residents who use banking or payment services products.

The first demographic selected was age, the respondents were adult Irish residents over the age of 18 years. The age category was broken down into ten age brackets (18-25, 25-30, 30-35, 35-40, 40-45, 45-50, 50-55, 55-60, 60-65, 65+) (Table 2). Most respondents were aged between 35 and 65 years old. Approximately 20% of respondents were aged between 35-40, 18.5% of respondents were in the 40 to 45 age group and 17.8% of respondents in the 45 to 50 age bracket (Table 2). There was a low number of respondents below the age 35

years and also above the age of 55 years (Table 2). The mean age from the data is 5.33 which translated to 41.65 years and a standard deviation of 1.94 (Table 3).

The second demographic data criteria was the gender of the participant, with response options available: Male, Female, Non-Binary and Other. There were 108 respondents who identified as males and 53 females and no one who identified as non-binary or other (Table 2). The mean of the gender demographic data was 1.33 and a standard deviation of 0.47 (Table 3).

The remainder of the questions in section 1 related to the respondent's current service providers (Table 2). These variables are dependent variables. The questions were chosen to establish whether the respondent uses traditional banks and/or FinTech providers. The selected questions also establish what services respondents have with their traditional bank or FinTech provider. This question selection allowed for data analysis of the penetration of FinTech's into the Irish markets across a range of service offerings and provided comparative analysis between the different users on the basis of service and service provider.

To ensure the questionnaire was easy for the respondents the question required them to select their service providers from a list of Traditional Banks and FinTech's (Central Bank, ) operating in the Irish markets, respondents could provide multiple options. The respondent's data was then coded and converted into data identifying if the respondent held a Bank account or payment service account with a traditional Bank a FinTech or both. The data break down for Traditional Bank was 53 respondents has Bank Account only, only 1 respondent had Payment Servicing only 1, 105 of the respondents had both and 2 respondents had None (Table 2). This yielded a mean result of 2.35 and a standard deviation 0.96 (Table 3).

Table 2 *Demographic Frequency data*

<b>Measure</b>	<b>Respondent data</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Age Group of Participant</b>	18-25	7	4.32
	25-30	6	3.70
	30-35	9	5.56
	35-40	33	20.37
	40-45	30	18.52
	45-50	32	19.75
	50-55	23	14.20
	55-60	15	9.26
	60-65	3	1.85
	65+	3	1.85
<b>Gender of Participant</b>	Male	108	66.67
	Female	53	32.72
<b>Traditional Bank</b>	Bank Account	53	32.72
	Payment Servicing	1	0.62
	Both	105	64.81
	None	2	1.23
<b>Fintech Bank Services</b>	Bank Account	22	13.58
	Payment Servicing	72	44.44
	Both	36	22.22
	None	31	19.14
<b>When Participant Last Open Bank Account</b>	In the last Year	20	12.35
	Between 1 & 2 Years	27	16.67
	Between 3 & 5 Years	31	19.14
	More than 5 Years ago	83	51.23
<b>How Participant opened Bank Account</b>	In person at a branch	109	67.28
	Online/ Digitally	52	32.10
<b>When Participant Last Open Payment Account</b>	In the last Year	46	28.40
	Between 1 & 2 Years	40	24.69
	Between 3 & 5 Years	29	17.90
	More than 5 Years ago	46	28.40
<b>How Participant opened Payment Account</b>	In person at a branch	45	27.78
	Online/ Digitally	116	71.60
<b>Note N =161</b>			

Table 3 *Demographic Statistics Questionnaire Section 1*

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Age Group of Participant</b>	161	1	10	5.33	1.94
<b>Gender of Participant</b>	161	1	2	1.33	0.47
<b>Traditional Bank</b>	161	1	4	2.35	0.96
<b>Fintech Bank Services</b>	161	1	4	2.47	0.96
<b>When Participant Last Open Bank Account</b>	161	1	4	3.10	1.09
<b>How Participant opened Bank Account</b>	161	1	2	1.32	0.47
<b>When Participant Last Open Payment Account</b>	161	1	4	2.47	1.18
<b>How Participant opened Payment Account</b>	161	1	2	1.72	0.45
<b>Valid N (listwise)</b>	161				

An additional dependent variable used related to the services currently provided by FinTech's or traditional Banks to the respondent. The response option to these questions were Bank Account, Payment Service, Both, None. The data breaks down for Fintech Bank Services: Bank Account only 22 respondents, Payment Servicing only 72 respondents, Both 36 respondents and None 31 respondents (Table 2). This data set gave a mean result of 2.47 and standard deviation of 0.96 (Table 3).

The last four questions in section 1 examined when the respondent last opened a Bank Account or Payment service account and how these accounts were opened. The response options for the time relevant questions were in the last Year, Between 1 & 2 Years, Between 3 and 5 Years, more than 5 Years ago. When the account was open data gave a mean of 3.10 and standard deviation of 1.09 (Table 3). This shows 51% of respondents opened their Bank account more than 5 years ago. For payment accounts the mean was 2.47 and a standard deviation of 1.18 (Table 3) with only 46 of respondents opening their account more than 5 years ago (Table 2).

The response options for how the bank account was opened were in person at a branch or online digital. How accounts were opened gave a mean of 1.32 (Table 3) or 67.28% of respondents (Table 2) for Bank accounts skewing towards in person account opening. With a mean of 1.72 (Table 3) and 71.60% of respondents (Table 2) for payment services accounts skewing to online opening.

## Section Two

The second part of the questionnaire was based on an adapted Technology Acceptance Model (TAM) (Davies, 1989) and focused on the element that contained in the actual usage variable. The responses in this section of the questionnaire required consideration and thought from the respondents prior to answering. The key direct variables that were the focus of this section were: Perceived ease of use (PE), Perceived usefulness (PU), Attitude (AT), Behavioural intention (BI), Digital Banking self-efficacy (SE), Subjective norm (SN) (Figure 2).

For analysis purposes the latent variables were 15 questions grouped into five constructs as defined in the TAM as outlined in table 1. Each construct was given an equal weighting to ascertain Actual Usage.

Likert scale is a popular method of measuring a latent variable, a variable that cannot be directly measured, by asking respondents to what extent they agree with a series of statements (Dawson, 2017). The respondent was presented with each statement/question and the corresponding response was allocated a numerical value between 1 and 5 mapped to the Likert scale as follows.

1. Strongly Disagree
2. Disagree

3. Neutral
4. Agree
5. Strongly Agree

For balance a neutral point response (number 3) was included allowed the respondent to 'sit on the fence' by selecting the middle 'neutral' category when considering the question statement posed. The respondent was asked how strongly she or he agrees or disagrees with a series of statements using a five-point rating scale. Possible responses were presented in a single line, as this is how respondents are most likely to process the data (Dillman *et al.*, 2014; Saunders *et al.*, 2015). The single line response format remained consistent for all questions in this section to avoid confusing respondents.

### Section Three

This section of the questionnaire applied the concepts from Behavioural Economics focusing on Nudge Theory as outlined by Thaler and Sustain (2009). The study evaluated the impact of nudging on the financial decision making when opening a Bank Account or a Payment Services Account. This study used the "digital Nudging" studies presented by Benartzi (2017) as the basis for the topic covered. Within this research study these areas have been operationalised into questions.

Social Norms was addressed in question number 21. The question was designed to investigate the impact of nudging and the social environment on the selection of bank account and payment provider. The question selected "The reason I chose my bank account provider" provides useful information regarding what respondents believe to be most important factor that impacts the selection criteria. The question provided eight response variables, including of the response "Email intervention- invitation" which allowed for analysis regarding utilisation of nudging technique in the Irish market currently. The other questions

in section 3 utilised a Five-point Likert scale following the same structure outlined in section two. Questions 22 and 23 looked at how user design of some digital banking functionality impacted the decisions made.

The focus in this section was on the power of mental accounting on screens, this is captured in two questions. The first question “Creating a single view of all my accounts in one place is important to me” allowed for understanding the view of the importance of the mental accounting capabilities to the respondents. The second question was “Saving Targets, Account analytics functionality offered by my digital banking has changed my Behaviour”. In this question the survey is examined if there had been any conscious change in behaviour by respondents when tools are made available. Nudging tends to be unconscious change in behaviour this question identified any potential outcomes from this.

Questions (24 A- F) relate to the perceived risk and the appeal of instant mobile. Questions 24c, and 24d relate to risk appetite questions, these were used to identify the impact of perceived risk of the respondents. With the questions looking to ascertain the importance of security of funds being transferred and of using digital platforms. For the purpose of the analysis these questions were grouped under Perceived risk analysis with each question given equal weighting. Questions 24a, 24b, 24e and 24f focused on the digital banking functionality and the appeal of making payments instantly. For the purpose of the analysis these questions were grouped under Instant Mobile for analysis, with each question given equal weighting.

Framework

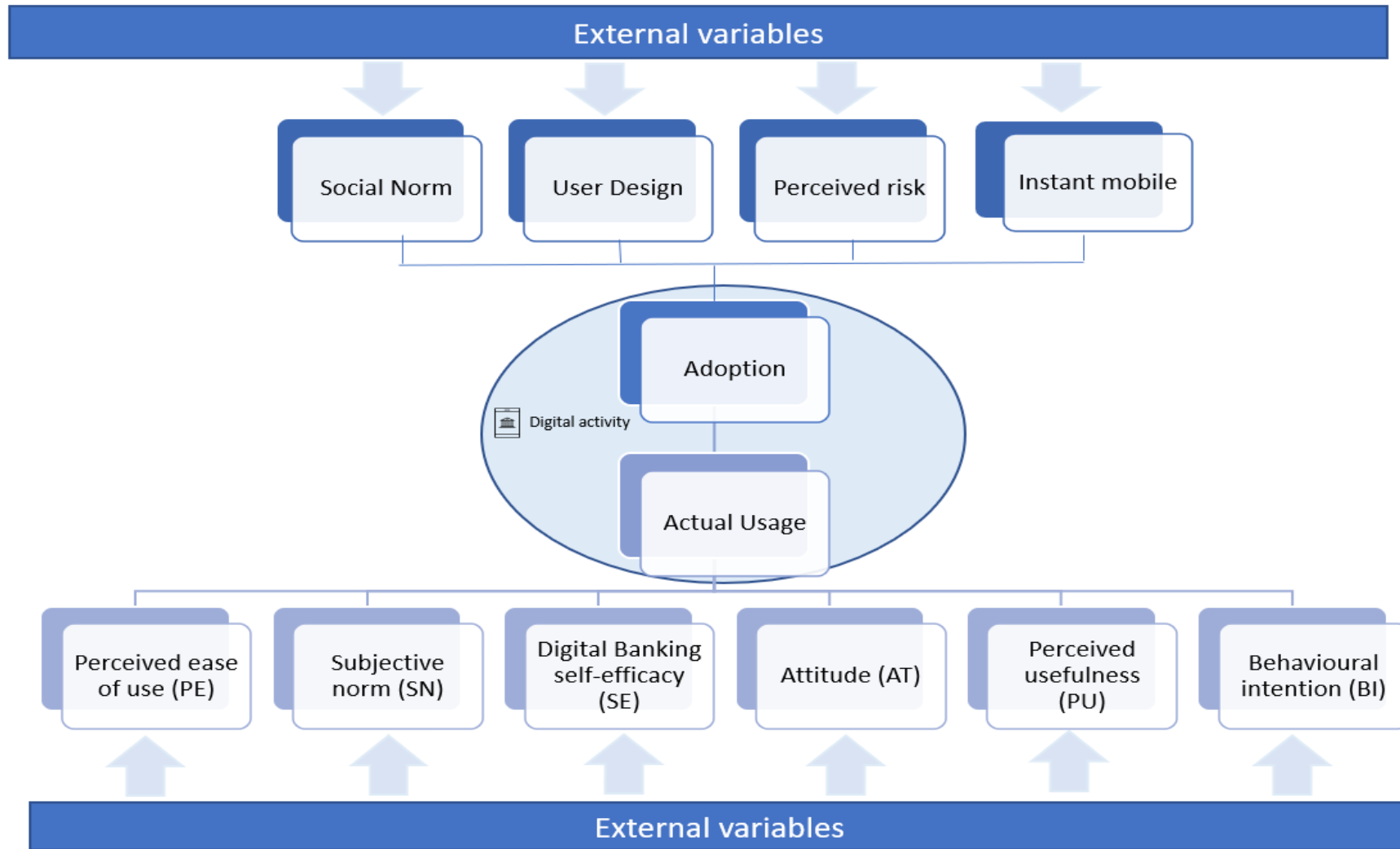


Figure 3 Research Framework

The Framework (Figure 3) created for this analysis utilised the TAM model to establish actual usage by combining each of the variables, Perceived ease of use (PE), Perceived usefulness (PU), Attitude (AT), Behavioural intention (BI), Digital Banking self-efficacy (SE), and Subjective norm (SN), allocation of equal weighting to each allowed for determination of the overall actual usage, mean for comparison and analysis (Table 4).

The second element of the framework included the Nudging variables: Social Norms, User Design, Perceived Risk, and Instant Mobile Functionality to assess their impact on the adoption of digital banking amongst the participants (Table 5).

### Data Analysis

Once the data was collected it was reviewed for quality and non-responses. For this analysis, the data was coded to simplify the analysis and reduce risk of analytical errors arising. The data was then loaded into SPSS within which the variables data was defined, named, and labelled. The relevant value subcategories were set up and applied to the coded data and the variable measures were also categorized.

As outlined in the design section, each question in the section to fed into the TAM model variables. Each question had a direct mapping either to Perceived ease of use (PE) Perceived usefulness (PU), Attitude (AT), Behavioural intention (BI), Digital Banking self-efficacy (SE) or Subjective norm (SN).

Table 4 *Descriptive Statistics Questionnaire Section 2*

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
I find Digital Banking easy to use (PE1)	161	1	5	1.91	1.148
I found it easy to open a Digital Bank Account (PE2)	161	1	5	2.37	1.268
I find it easy to access Banking and Payment services using Digital platforms (PE£)	161	1	5	1.96	1.101
<b>Perceived ease of use (PE)</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.0807</b>	<b>1.04135</b>
Digital Banking improves Banking Services (PU1)	161	1	5	2.06	1.321
Digital Banking reduces the cost of my Banking activity (PU2)	161	1	5	2.78	1.312
<b>Perceived usefulness (PU)</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.4224</b>	<b>1.11321</b>
Using Digital Platforms for banking is a good idea (AT1)	161	1	5	2.01	1.146
I feel Digital Platforms are safe to use for my Banking activity (AT2)	161	1	5	2.30	1.084
I am positive toward using Digital Banking (AT3)	161	1	5	1.99	1.146
<b>Attitude (AT)</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.1014</b>	<b>1.01656</b>
I will stay in touch with the latest service offering from my Digital Banking Provider	161	1	5	3.12	1.139
I will be a frequent user of Digital Banking	161	1	5	1.91	1.217
I intend to move more of my Banking activities to digital Platforms	161	1	5	2.60	1.272
<b>Behavioural intention (BI)</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.5445</b>	<b>0.93072</b>
I feel confident finding the support I require when using Digital Banking?	161	1	5	2.67	1.213
I have the necessary skills for using Digital Banking	161	1	5	1.88	1.177
I would recommend using Digital Banking to a friend	161	1	5	2.01	1.217
<b>Digital Banking self efficacy (SE)</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.1843</b>	<b>1.06125</b>
I like using Digital Banking as its used by Friends and family (SN1)	161	1	5	2.29	1.232
<b>Subjective Norm</b>	<b>161</b>	<b>1</b>	<b>5</b>	<b>2.29</b>	<b>1.232</b>
<b>Actual usage</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.2698</b>	<b>0.91809</b>
<b>Valid N (listwise)</b>	<b>161</b>				

Table 4 *Descriptive Statistics Questionnaire Section 3*

	N	Minimum	Maximum	Mean	Std. Deviation
The reason I chose my Account provider	<b>161</b>	<b>1</b>	<b>8</b>	<b>4.70</b>	<b>2.326</b>
<b>Social Norms (BE)</b>	<b>161</b>	<b>1</b>	<b>8</b>	<b>4.70</b>	<b>2.326</b>
Creating a single view of all my accounts in one place is important to me	161	1	5	2.27	1.283
Saving Targets, Account analytics functionality offered by my digital banking has changed my Behaviour	162	1	5	3.28	1.463
<b>User Design</b>	<b>161</b>	<b>1.00</b>	<b>5.00</b>	<b>2.7733</b>	<b>1.11376</b>
Security of the funds being transferred	162	1	5	2.10	1.088
Security of digital banking application	162	1	5	2.18	1.184
<b>Perceived Risk</b>	<b>153</b>	<b>1.00</b>	<b>4.50</b>	<b>2.0817</b>	<b>0.95362</b>
To make payments instantly	162	1	5	1.90	1.107
Simply send funds to friends and family	162	1	5	2.53	1.191
Ability to split bill payments	162	1	5	3.46	1.257
Other Functionality	162	1	5	3.04	0.589
<b>Instant Mobile Functionality</b>	<b>162</b>	<b>1.25</b>	<b>4.25</b>	<b>2.7299</b>	<b>0.68818</b>
Valid N (listwise)	161				

To facilitate the analysis of the data and apply the TAM framework each question was mapped to into the relevant TAM category, with the exception of Subjective norm (SN), as there is only one question in this category removing the requirement to create a group variable. For the purpose of data control, frequency analysis was performed to ensure there were no anomalies within the data set that had been identified previously.

Descriptive statistics were run across each of the variables providing mean and standard deviation information that was used as part of the analysis in the results chapter. (Tables 3, 4 & 5)

## Ethics

Several controls were in place to ensure research ethics standards were adhered to. In the first instance, participants were asked to consent to their response forming part of this research study and were informed of the purpose of the research.

Secondly, this research has been created in a way that prevents respondents from being identified. There was minimal personal data requested and no data that could be used to identify respondents was required to be shared. No names or emails address were collected as part of the study, and neither were dates of births or exact ages. Upon completion of the survey the resource data was coded, and a control number applied as the only identifier used for individual data lines.

The data was uploaded on the onto the university's central storage location. Any data that can be used to identify respondents will be destroyed once the analysis and assignment are fully completed.

## Hypothesis

The hypothesis used analysed the five main indirect variables, Age, Gender, if currently a FinTech client, when respondents last opened the bank account, how respondents opened there account to identify significant variations in results. These indirect variables were analysed against the direct variables. The first analysis was the actual usage as outlined in the framework (Figure 3). This consisted of the TAM variable of, Perceived ease of use (PE), Perceived usefulness (PU), Attitude (AT), Behavioural intention (BI), Digital Banking self-efficacy (SE), Subjective norm (SN). These variables were analysed for variances against the

Nudging framework i.e. Social Norms, User Design, Perceived risk and Instant Mobile functionality

### *Age Hypothesis*

H1a: The age of a respondent has a significant impact on digital banking actual usage

H1b: The age of a respondent has a significant impact on what influenced them to open the account

H1c: The age of a respondent has a significant impact on digital banking User Design

H1d: The age of a respondent has a significant impact on digital banking Perceived Risk

H1e: The age of a respondent has a significant impact on digital banking Instant Mobile Functionality

### *Gender Hypothesis*

H2a: There is a significant difference in responses by gender on digital banking actual usage

H2b: There a significant difference in responses by gender on the influence of Social Norms.

H2c: There is a significant difference in responses by gender on digital banking User Design

H2d: There is a significant difference in responses by gender on digital banking Perceived Risk

H2e: There is a significant difference in responses by gender on the perception of digital banking Instant Mobile Functionality

*FinTech Hypothesis*

H3a: If a respondent is currently a FinTech customer has a significant impact on digital banking actual usage

H2b: If a respondent is currently a FinTech customer has a significant impact on what influenced them to open the account

H3c: If a respondent is currently a FinTech customer has a significant impact on digital banking User Design score

H3d: If a respondent is currently a FinTech customer has a significant impact on digital Banking Self Efficiency

H3e: If a respondent is currently a FinTech customer has a significant impact on digital banking Perceived Risk score

H3f: If a respondent is currently a FinTech customer has a significant impact on Instant Mobile Functionality score

*Timing of Account opening*

H3a: When respondents opened the account has a significant impact on digital banking actual usage

H2b: When respondents opened the has a significant impact on what influenced them to open their account

H3c: When respondents opened the has a significant impact on digital banking User Design score

H3d: When respondents opened the has a significant impact on digital Banking Self Efficiency

H3e: When respondents opened the has a significant impact on digital banking Perceived Risk score

H3f: When respondents opened the has a significant impact on Instant Mobile Functionality score

*How account was opened*

H3a: How account was opened has a significant impact on digital banking actual usage

H2b: How account was opened has a significant impact on what influenced them to open their account

H3c: How account was opened has a significant impact on digital banking User Design score

H3d: How account was opened has a significant impact on digital banking Perceived Risk score

H3e: How account was opened has a significant impact on Instant Mobile Functionality score

## Results

### Descriptive Statistics

Descriptive statistics allow for description and comparison of a variable's data values numerically. (Saunders *et al.* 2015). If a categorical variable and a numerical variable are to be compared, then descriptive statistics of the numerical variable for each category of the categorical value are a useful way to display this (Dawson, 2017).

Descriptive statistics was used to screen the data obtained and check for errors. For example, any value of a variable outside the range of the minimum and maximum possible value would indicate an error (Dawson, 2017). Likewise, a mean or standard deviation outside the expected values would also indicate an error (Dawson 2017). In the event of an error suspected raw data was examined to identify if an error had occurred and the error corrected.

The descriptive statistical results analysed the demographic characteristics of the respondents as outlined below:

- Age
- Gender
- Current Bank
- Types of Services Used
- Current Fintech provider
- Types of Services Used
- When was the last time you opened a new banking/ FinTech relationship.

The age distribution of respondents, people aged 26-35 years old (56.07%) (Table 2) accounted for the highest proportion, and new technologies and lifestyles are always first accepted by these consumers. Thus, this sampling was reasonable.

User frequency, frequent users (68.73%) (Table 2) accounted for a relatively high proportion, indicating that the popularizing rate of FinTech services is relatively high at present, and the study of the factors affecting their adoption is of great practical significance to the successful implementation of FinTech strategies in banks (Figure 2).

An interest variable to note as part of the frequency data is on the social norms responses on what influences decisions when opening account while the highest number of responses (38.5%) came from those who did their own research to determine what account they would open 21% were influenced by a friend and 3% were influenced from an email invite.

Table 5 *Frequency Statistics Social norm.*

	Frequency	Percent (%)
<b>A friend recommended</b>	34	21.1
<b>An advertisement made me interested</b>	12	7.5
<b>Direct Marketing</b>	3	1.9
<b>I got an email invitation from a friend</b>	5	3.1
<b>I relate to the Brand</b>	9	5.6
<b>I researched myself</b>	62	38.5
<b>Other</b>	35	21.7
<b>Sponsorship of an event or team</b>	1	0.6
<b>Total</b>	161	100.0

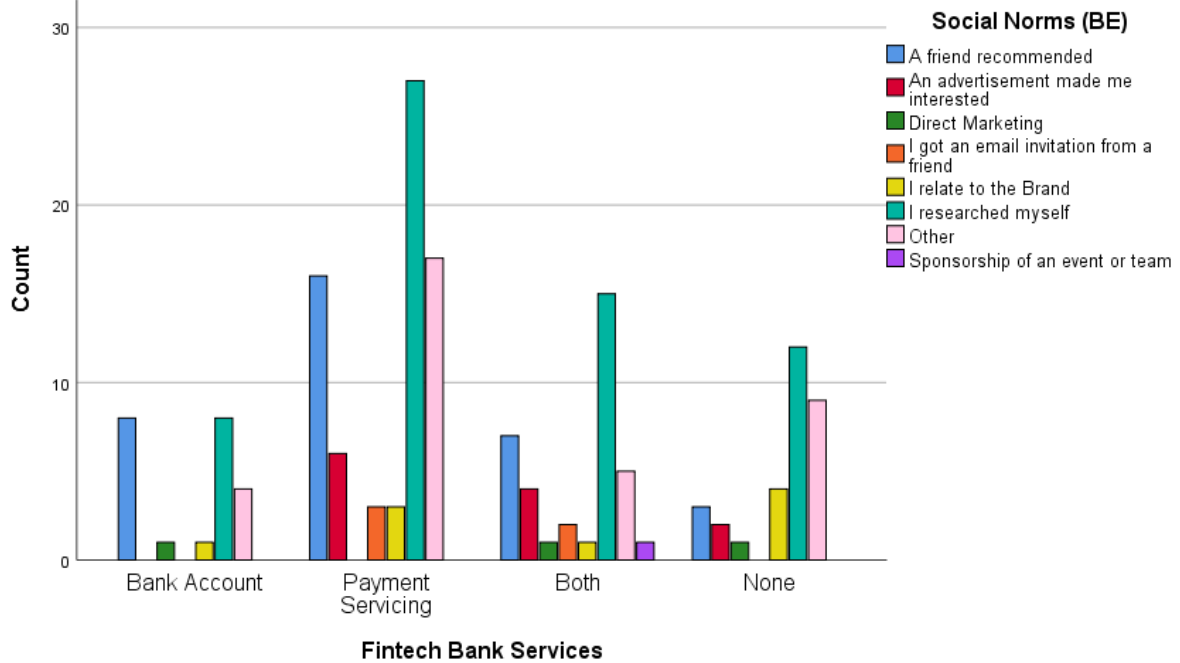


Figure 4 Social norms that influence FinTech Bank Services.

The influence of social norms on FinTech banking services was examined, the importance of a friend's recommendation is disproportionately higher than the other social norms (Figure 4).

#### Test for Normality.

Prior to performing statistical analysis, it was necessary to establish the distribution of the values for variables containing numerical data. The data was plotted on a frequency bar chart. Symmetric distribution, where the data plotted yields as a bell-shaped curve, is known as normal distribution (Saunders *et al.* 2015). If the graph exhibited a bunching to the left and a long tail to the right, therefore the data was deemed to be positively skewed.

On reviewing the descriptive statistics there was no sign of data corruption or erroneous responses. However, upon review of the responses for actual usage based on the TAM model the responses were skewed positive. While this is indicative of a favourable environment in relation to the Perceived usefulness etc of digital banking from the respondents it also raised questions on the normality of the data (Figure 5). The data obtained (Figure 5) does not reflect a bell-shaped curve and therefore a deviation from normality was recorded. Deviation from normality is often the case with surveys (Dawson, 2017).

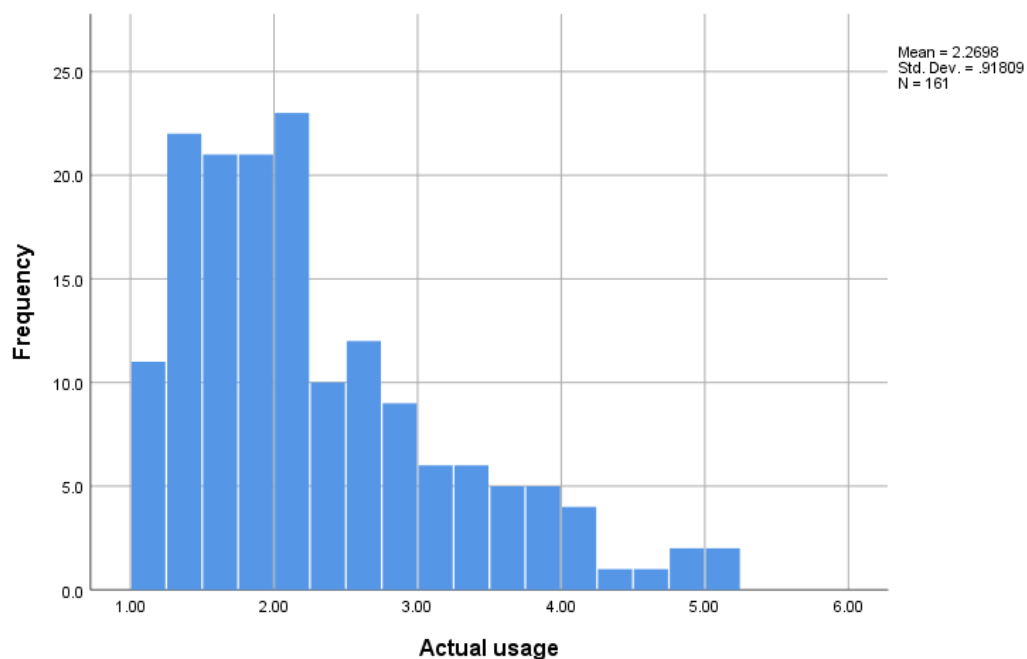


Figure 5 Actual Usage Frequency bar chart.

In preparation of the Inferential Statistics the Non-Normality of data was confirmed. Normality tests were performed on the data across each of the variables. The Graphical

output from the histograms across each variable was analysed and in each case the data was shown to be skewed as displayed in Figure 5. The QQ plot graph was also run for each variable which confirmed the data had a non-normal distribution. Figure 6 shows a normal distribution of data and Figure 7 shows the distribution for the variable Perceived Ease of use.

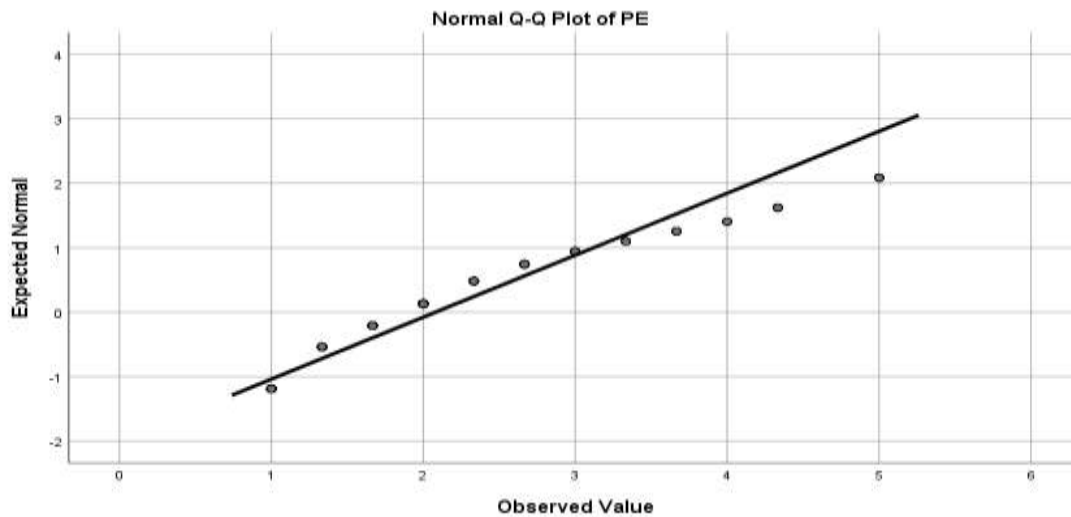


Figure 6 Normal QQ Plot normal distribution

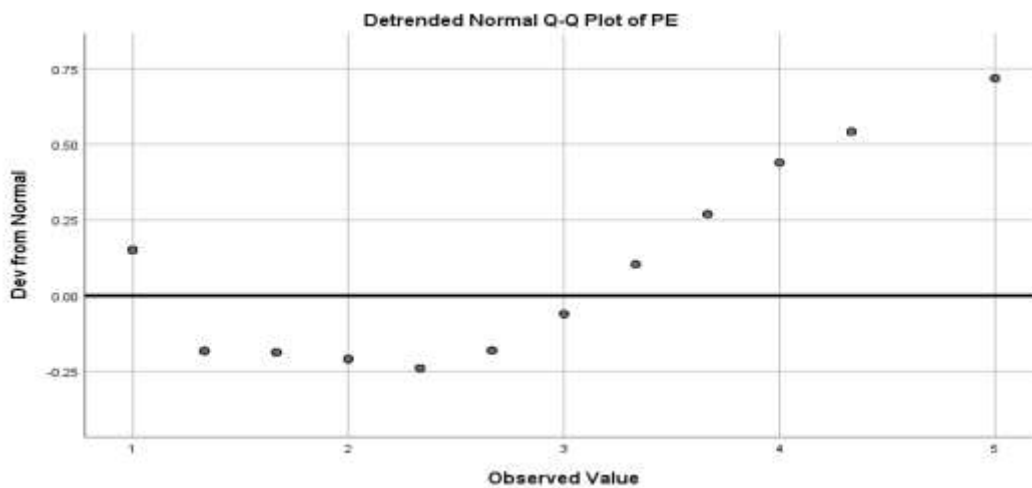


Figure 7 Sample Non-Normal QQ plot obtained for Perceived Ease of use

## Non-parametric statistics

To use T-tests & ANOVA the assumptions include that the sample data came from a population that resembles a normal distribution and that the variances of the populations being compared are equal (this concept is called homogeneity of variance). These assumptions need not be met when using non-parametric tests (Scherbaum *et al.* 2015). Non-parametric tests (distribution-free tests) do not require the same assumptions about a population distribution. When the dependent variable is ordinal or nominal data, assumptions about the distribution cannot be made, so non-parametric tests must be used (Scherbaum *et al.* 2015)

Due the distribution spread and the distribution not being evident related to any obvious outliers it was not deemed appropriate to use analytical tools that assume normality. This ruled out the use of T-tests & ANOVA for the analyses. This study will therefore use Non-parametric tests as there is no assumption the data fits a specific distribution.

There are a large number of non-parametric tests, but two of the more common tests in business and management studies are the Mann-Whitney U test and the chi-square test of independence. The Mann-Whitney U test provides information about the association between variables when both are measured on an ordinal scale (i.e. does the rank order on variable X have any association with the order on variable Y?) (Scherbaum *et al.* 2015). Nonparametric statistics are designed primarily for use with categorical (dichotomous, nominal, ordinal) data where there is no distributional model and so we cannot use statistics to estimate parameters (Saunders *et al.* 2015)

If there are more than two levels of the independent variable, there are several different tests that can be used. The test selected for this research was the Kruskal Wallis Test. This test uses the median to examine differences between groups in the ranks on the dependent variable. The e Kruskal–Wallis one-way analysis of variance by ranks (to give the test its full name) was developed for use in situations in which one or more of these assumptions is not met (Frey 2018).

## Inferential statistics

### Age analysis

The effect of a range of direct variables: Actual usage (H1a), Social Norms (H1b), User Design (H1c), Perceived Risk (H1d) and Instant Mobile Functionality (H1e) (Table 6) on the independent variable age demographic was examined. Statistical analysis was performed, the Kruskal-Wallis Test was carried out and the result was deemed significant if the P value obtained was  $\leq 0.05$ . The number of participant responses varied across age groups (Figure 8) therefore some of the age group's responses were less statistically reliable than others.

Table 6 Age Hypothesis Test Results Summary

Hypothesis Reference	Null Hypothesis	Test	Significance (P Value)	Decision
H1a	The distribution of actual usage is the same across categories of age group of participant .	Independent-Samples Kruskal-Wallis Test	0.004*	Reject the null hypothesis.
H1b	The distribution of Social Norms (BE) is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.003*	Reject the null hypothesis.
H1c	The distribution of User Design is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.444	Retain the null hypothesis.
H1d	The distribution of Perceived Risk is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.048*	Reject the null hypothesis.
H1e	The distribution of Instant Mobile Functionality is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.969	Retain the null hypothesis.

\*Significant  $P \leq 0.05$

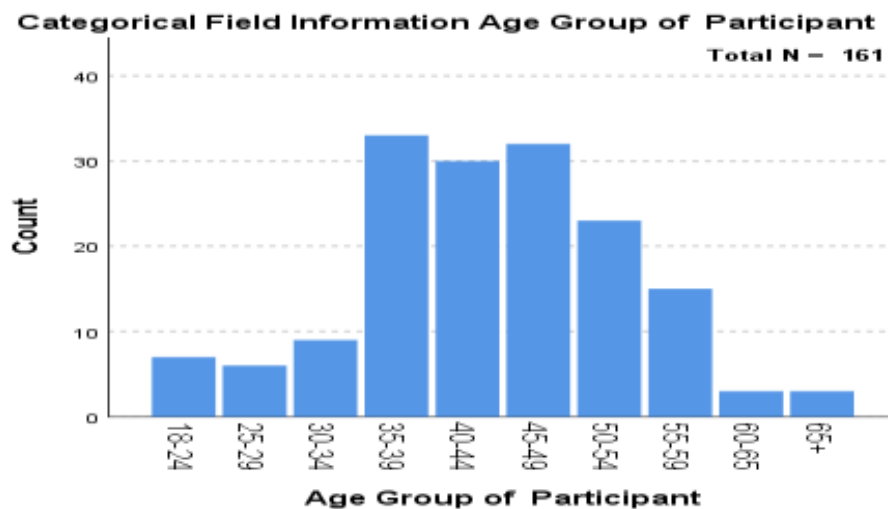


Figure 8 Categorical Field Information Age group of participant.

### H1a: Non Parametric Tests (Kruskal-Wallis Test between Age of Perception and Actual Usage)

Null Hypothesis: There is no difference in responses based on age to the actual usage, as set out in the TAM framework, of digital banking

Alternative Hypothesis: There is a difference in responses based on age to the actual usage, as set out in the TAM framework, of digital banking.

Table 7 *Independent Samples Kruskal Wallis Test Summary*

Independent-Samples Kruskal-Wallis Test Summary	
<b>Total N</b>	161
<b>Test Statistic</b>	24.264 <sup>a</sup>
<b>Degree Of Freedom</b>	9
<b>Asymptotic Sig.(2-sided test)</b>	.004
<b>a. The test statistic is adjusted for ties.</b>	

Table 8 *Age group of participants rank*

Age Group of Participant	N	Mean Rank
<b>Actual Usage</b>	18-24	49.21
	25-29	69.08
	30-34	48.11
	35-39	66.15
	40-44	90.33
	45-49	78.11
	50-54	98.20
	55-59	93.73
	60-65	128.67
	66+	135.33
<b>Total</b>	<b>161</b>	

The Kruskal-Wallis H test showed that there was a statistically significant difference in score between the different age levels, Kruskal-Wallis H1a = 24.164,  $p = .004$  (Table 7) with a mean rank actual usage of 49.21 for 18-24 age group, ranging up to 135.33 for the over for 66+

age group. The data rejects the null hypothesis as there is there is at least one difference in actual usage among different age groups (Table 8).

Table 9 *Pairwise Comparisons of Age Group of Participant significance table*

<b>Age Group</b>	<b>Test Statistic</b>	<b>Std. Error</b>	<b>Std. Test Statistic</b>	<b>Sig.</b>
<b>30-35-40-44</b>	-42.222	17.716	-2.383	0.017
<b>30-34-55-59</b>	-45.622	19.654	-2.321	0.020
<b>30-34-50-54</b>	-50.085	18.327	-2.733	0.006
<b>30-34-60-65</b>	-80.556	31.076	-2.592	0.010
<b>30-34-66+</b>	-87.222	31.076	-2.807	0.005
<b>18-24-40-44</b>	-41.119	19.566	-2.102	0.036
<b>18-24-55-59</b>	-44.519	21.337	-2.086	0.037
<b>18-24-50-54</b>	-48.981	20.121	-2.434	0.015
<b>18-24-60-65</b>	-79.452	32.166	-2.470	0.014
<b>18-24-66+</b>	-86.119	32.166	-2.677	0.007
<b>35-39-40-44</b>	-24.182	11.759	-2.056	0.040
<b>35-39-50-54</b>	-32.044	12.661	-2.531	0.011
<b>35-39-60-65</b>	-62.515	28.109	-2.224	0.026
<b>35-39-66+</b>	-69.182	28.109	-2.461	0.014
<b>25-29-66+</b>	-66.250	32.961	-2.010	0.044

By analysing the Pairwise Comparisons of Age table the breakdown of the statistically significant difference between (18-24-40-44), (30-35-40-44), (35-39-40-44), (35-39-50-54), (18-24-50-54), (30-34-50-54), (18-24-55-59), (30-34-55-59), (35-39-60-65),(30-34-60-65),(18-24-60-65),(35-39-66+),(25-29-66+),(45-49-66+),(18-24-66+),(30-34-66+)(Table 10) age groups are identified.

**H1b: Non-Parametric test (Kruskal-Wallis Test) between Age of Respondents and on what Social Norm influenced them to open the account**

Null Hypothesis: There is no significant difference in responses based on age to the attitudes to Social Norm of digital banking

Alternative Hypothesis: There is significant difference in responses based on age to the attitudes to Social Norm of digital banking

Table 10 *Independent Samples Kruskal Wallis Test Summary*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	24.953 <sup>a</sup>
<b>Degree Of Freedom</b>	9
<b>Asymptotic Sig.(2-sided test)</b>	0.003

The Kruskal-Wallis H test showed that there was a statistically significant difference in score between the different age levels, Kruskal-Wallis H1a = 24.953,  $p = .003$  (Table 10). The data rejects the null hypothesis as there is there is at least one difference in actual usage.

By analysing the Pairwise Comparisons of Age table the breakdown of the statistically significant difference between (30-34-45-49), (30-34-40-44),(30-34-35-39),(18-24-45-49),(18-24-40-44),(18-24-35-39),(18-24-50-54),(30-34-50-54),(30-34-55-59),(18-24-60-65),(30-34-60-65) (Table 12 ) age groups are identified.

Table 11 *Pairwise Comparisons of Age Group of Participant significance*

Age Group	Test Statistic	Std. Error	Std. Test Statistic	Sig.
<b>30-34-45-49</b>	-38.788	16.896	-2.296	0.022
<b>30-34-55-59</b>	-39.711	18.881	-2.103	0.035
<b>30-34-40-44</b>	-50.478	17.019	-2.966	0.003
<b>30-34-35-39</b>	-54.126	16.840	-3.214	0.001
<b>30-34-50-54</b>	-60.379	17.607	-3.429	0.001
<b>30-34-60-65</b>	-89.778	29.854	-3.007	0.003
<b>18-24-45-49</b>	-37.129	18.685	-1.987	0.047
<b>18-24-40-44</b>	-48.819	18.797	-2.597	0.009
<b>18-24-35-39</b>	-52.468	18.634	-2.816	0.005
<b>18-24-50-54</b>	-58.720	19.330	-3.038	0.002
<b>18-24-60-65</b>	-88.119	30.901	-2.852	0.004

*H1c Non-Parameteoric test (Kruskal-Wallis Test) between Age of Respondents and User Design.*

Null Hypothesis: There is no significant difference in responses based on age to the attitudes to user design of digital banking

Alternative Hypothesis: There is a significant difference in responses based on age to the attitudes to user design of digital banking

Table 12 *Hypothesis Test Summary*

	Null Hypothesis	Test	Sig.	Decision
<b>1</b>	The distribution of User Design is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.444	Retain the null hypothesis.

Table 13 *Independent Samples Kruskal Wallis Test Summary*

Independent-Samples Kruskal-Wallis Test Summary	
<b>Total N</b>	161
<b>Test Statistic</b>	8.932 <sup>a,b</sup>
<b>Degree Of Freedom</b>	9
<b>Asymptotic Sig.(2-sided test)</b>	0.444
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 14 *Pairwise Comparisons of Age Group of Participant significance*

Age Group of Participant	N	Mean Rank
<b>User Design</b>		
18-24	7	58.43
25-29	6	59.25
30-34	9	75.78
35-39	33	83.29
40-44	30	75.78
45-49	32	76.06
50-54	23	91.15
55-59	15	93.37
60-65	3	124.83
66+	3	89.00
Total	161	

The Kruskal-Wallis H test showed that there was no statistically significant difference in User Design influence per age category the different background, Kruskal-Wallis H = 8.932, p = 0.444, with a mean rank User Design score of 58.43 the 18-24 group and 124.83 for the 60-65 group (Table 14). Based on the analysis the findings fail to reject the null hypothesis so there is no difference in influence of User Design among different age groups.

### H1d: Non-Parametric test (Kruskal-Wallis Test) between Age of Respondents and of Instant Mobile Functionality

Null Hypothesis: There is no significant difference in responses based on age to the Perceived Risk

Alternative Hypothesis: There is a significant difference in responses based on age to the Perceived Risk

Table 15 Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Perceived Risk is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.048	Reject the null hypothesis.
<b>Asymptotic significances are displayed. The significance level is 0.050.</b>				

Table 16 Independent-Samples Kruskal-Wallis Test Summary

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
	Perceived Risk
<b>Kruskal-Wallis H</b>	17.053
<b>Df</b>	9
<b>Asymp. Sig.</b>	0.048

The Kruskal-Wallis H test showed that there was a statistically significant difference in score between the different age levels, Kruskal-Wallis H = 17.053, p = 0.048, (Table 17) with a mean rank actual usage of 111.43 for 18-24 age group, ranging down to 67.67 for the over 66+ age group (Table 17) The data rejects the null hypothesis as there is at least one difference in actual usage among different Age groups.

Table 17 *Age Group of Participant Ranks Perceived Risk*

<b>Age Group of Participant Ranks Perceived Risk</b>			
<b>Age Group of Participant</b>		<b>N</b>	<b>Mean Rank</b>
<b>Perceived Risk</b>	18-24	7	111.43
	25-29	5	76.50
	30-34	8	101.44
	35-39	33	85.30
	40-44	29	81.21
	45-49	28	64.98
	50-54	23	55.28
	55-59	15	75.87
	60-65	2	102.50
	66+	3	67.67
	Total	153	

By analysing the Pairwise Comparisons of Age table the breakdown of the statistically significant difference between (50-54-40-44),(50-54-35-39),(50-54-30-34), (50-54-18-24),(45-49-30-34), (45-49-18-24) (Table 18) age groups are identified.

Table 18 *Pairwise Comparisons of Age Group of Participant*

Age Group	Test Statistic	Std. Error	Std. Test Statistic	Sig.
50-54-40-44	25.924	12.159	2.132	0.033
50-54-35-39	30.020	11.828	2.538	0.011
50-54-30-34	46.155	17.874	2.582	0.010
50-54-18-24	56.146	18.797	2.987	0.003
45-49-30-34	36.455	17.457	2.088	0.037
45-49-18-24	46.446	18.402	2.524	0.012

### H1e: Non-Parametric Tests (Kruskal-Wallis Test) between Age of Respondents and of Instant Mobile Functionality

Null Hypothesis: There is no significant difference in responses based on age to the attitudes to words of Instant Mobile Functionality of digital banking

Alternative Hypothesis: There is a significant difference in responses based on age to the attitudes to words of Instant Mobile Functionality of digital banking

Table 19 *Hypothesis Test Summary*

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Instant Mobile Functionality ( is the same across categories of Age Group of Participant .	Independent-Samples Kruskal-Wallis Test	0.931	Retain the null hypothesis.

**Asymptotic significances are displayed. The significance level is .050.**

Table 20 *Independent-Samples Kruskal-Wallis Test Summary*

<b>Total N</b>	133
<b>Test Statistic</b>	3.679 <sup>a,b</sup>
<b>Degree Of Freedom</b>	9
<b>Asymptotic Sig.(2-sided test)</b>	.931
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 21 *Mean Ranks Instant Mobile Functionality*

<b>Mean Ranks Instant mobile Functionality</b>			
<b>Age Group of Participant</b>		<b>N</b>	<b>Mean Rank</b>
<b>Functionality</b>	18-24	7	75.21
	25-29	6	62.42
	30-34	9	82.94
	35-39	33	87.38
	40-44	30	85.03
	45-49	32	74.11
	50-54	23	78.52
	55-59	15	84.73
	60-65	3	88.00
	66+	3	82.17
	Total	161	

The Kruskal-Wallis H test showed that there was no statistically significant difference in User Design influence per age category the different background, Kruskal-Wallis H (4) = 3.673,  $p = 0.931$ , with a mean rank Instant Mobile functionality score of 62.42 the 25-29 group ranging up to 88.00 for the 60-65 group (Table 21). Based on the analysis the findings fail to reject the null hypothesis so there is no difference in influence of instant mobile functionality among different age groups.

## Gender Analysis

Table 22 *Gender Hypothesis Test Summary*

	<b>Null Hypothesis</b>	<b>Test</b>	<b>Sig.</b>	<b>Decision</b>
<b>H2a</b>	The distribution of Actual usage is the same across categories of Gender of Participant .	Independent-Samples Mann-Whitney U Test	0.832	Retain the null hypothesis.
<b>H2b</b>	The distribution of Social Norms (BE) is the same across categories of Gender of Participant .	Independent-Samples Mann-Whitney U Test	0.404	Retain the null hypothesis.
<b>H2c</b>	The distribution of User Design is the same across categories of Gender of Participant .	Independent-Samples Mann-Whitney U Test	0.693	Retain the null hypothesis.
<b>H2d</b>	The distribution of Perceived Risk is the same across categories of Gender of Participant .	Independent-Samples Mann-Whitney U Test	0.419	Retain the null hypothesis.
<b>H2e</b>	The distribution of Instant Mobile Functionality is the same across categories of Gender of Participant .	Independent-Samples Mann-Whitney U Test	0.347	Retain the null hypothesis.

**Asymptotic significances are displayed. The significance level is .050.**

The effect of a range of direct variables: Actual usage (H2a), Social Norms (H2b), User Design (H2c), Perceived Risk (H2d) and Instant Mobile Functionality (H2e) (Table 22) on the independent variable age demographic was examined. Statistical analysis was performed, Mann-Whitney U Test was carried out and the result was deemed significant if the P value obtained was  $\leq 0.05$ . The number of participant responses varied across gender groups (Figure 9) with 108 male and 53 female respondents (Graph)

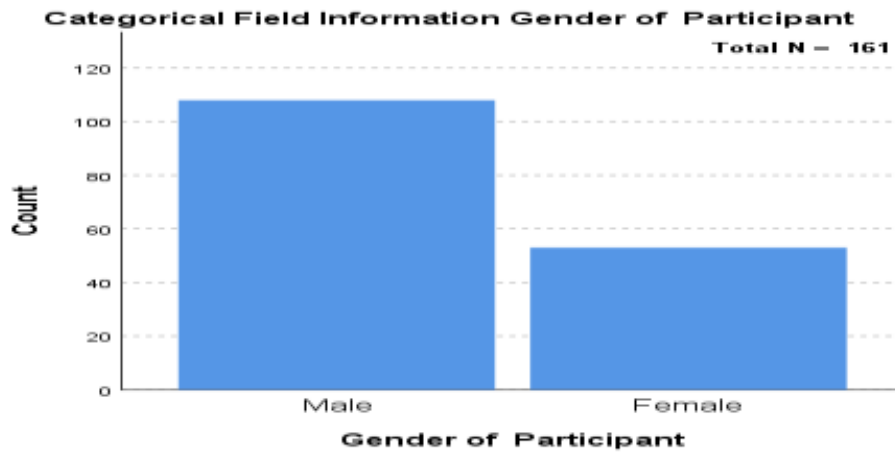


Figure 9 *Categorical Field Information Gender of Participant.*

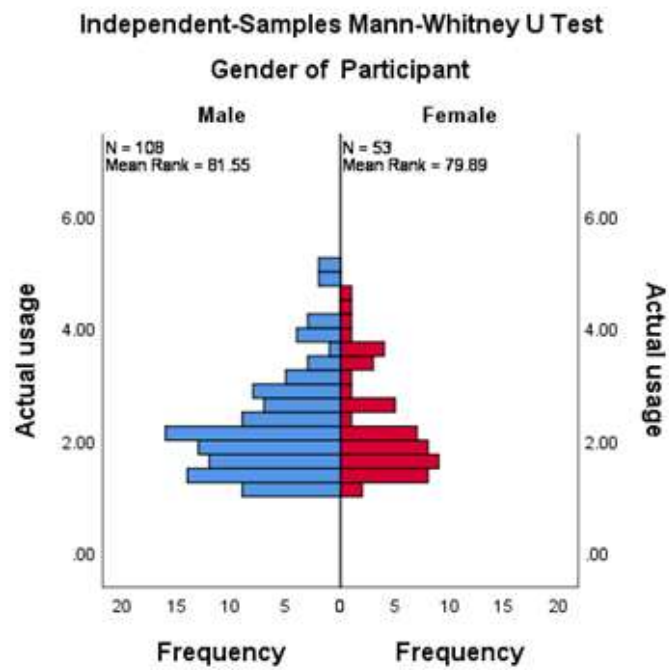


Figure 10 *Independent Mann Whitney U Test: Actual Usage*

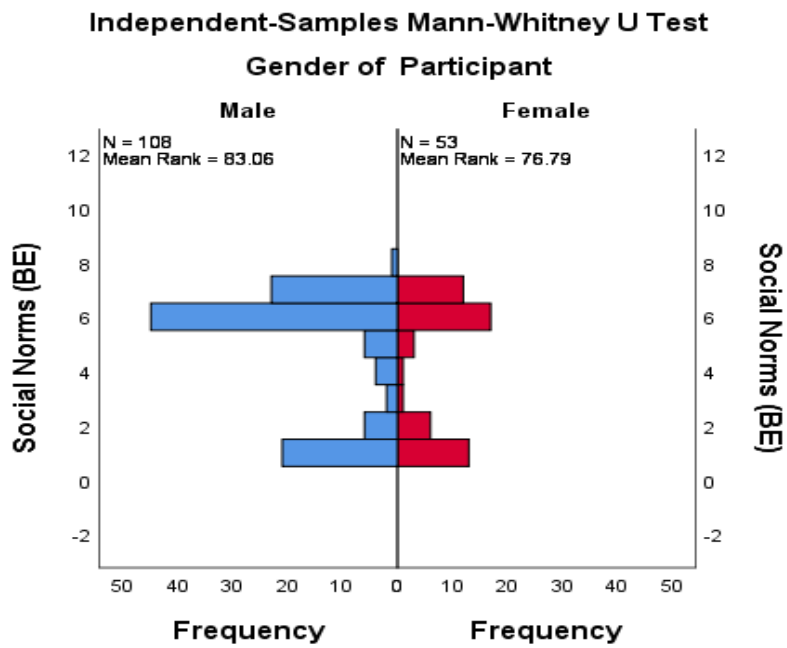


Figure 11 *Independent Mann Whitney U Test: Social Norms*

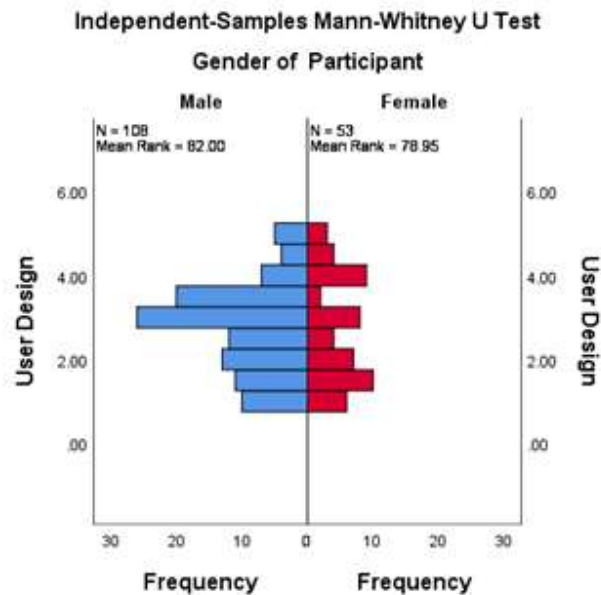


Figure 12 *Independent Mann Whitney U Test: User Design*

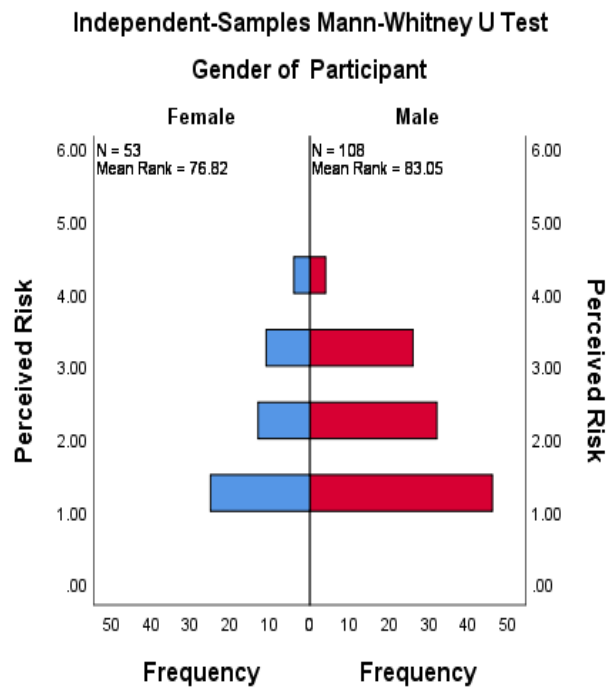


Figure 13 *Independent Mann Whitney U Test: Perceived Risk*

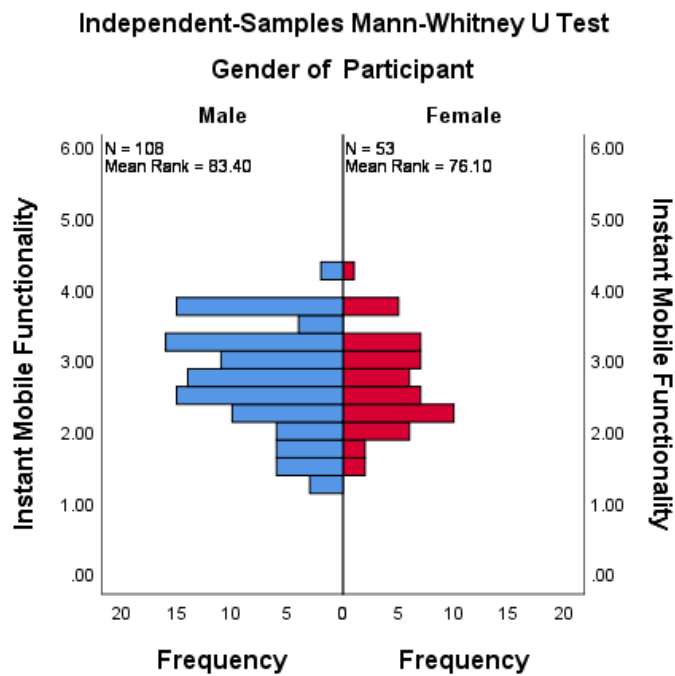


Figure 14 *Independent Mann Whitney U Test: Instant Mobile Functionality*

H2a: Null Hypothesis: There is no significant difference in responses by gender on digital banking actual usage

Alternative Hypothesis: There is a significant difference in responses by gender on digital banking actual usage

H2b: Null Hypothesis: There is no significant difference in responses by gender on the influence of Social Norms.

Alternative Hypothesis: There a significant difference in responses by gender on the influence of Social Norms.

H2c: Null Hypothesis: There is no significant difference in responses by gender on digital banking User Design

Alternative Hypothesis: There is a significant difference in responses by gender on digital banking User Design

H2d: Null Hypothesis: There is no significant difference in responses by gender on digital banking Perceived Risk

Alternative Hypothesis: There is a significant difference in responses by gender on digital banking Perceived Risk

H2e: Null Hypothesis: There is no significant difference in responses by gender on the perception of digital banking Instant Mobile Functionality

Alternative Hypothesis: There is a significant difference in responses by gender on the perception of digital banking Instant Mobile Functionality

The Independent-Samples Mann-Whitney U test showed that there was no statistically significant difference in Actual Usage, Social norms, User Design, Perceived Risk, and Instant Mobile functionality. Independent-Samples Mann-Whitney U showed a mean rank for:

- Actual Usage of Male Mean Rank 81.55 Female 79.89 (Figure 10) Significance P= 0.832 (Table 22)
- Social norms of Male Mean Rank 83.06 Female 76.79 (Figure 11) Significance P= 0.404 (Table 22)
- User Design of Male Mean Rank 82.00 Female 78.95 (Figure 12) Significance P= 0.693 (Table)
- Perceived Risk Male Mean Rank 84.53 Female 73.80 (Figure 13) Significance P= 0.419 (Table 22)
- Instant Mobile functionality Mean Rank Male 83.40 Female 76.10 (Figure 14) P= 0.347 (Table 22)

Based on the analysis the findings fail to reject the null hypothesis so there is no difference in Actual Usage, Social norms, User Design, Perceived Risk, and Instant Mobile functionality across Gender.

### FinTech Analysis

The effect of a range of direct variables: Actual usage (H2a), Social Norms (H2b), User Design (H2c), Perceived Risk (H2d) and Instant Mobile Functionality (H2e) (Table 23) on the independent variable age demographic was examined. Statistical analysis was performed,

Kruskal-Wallis Test was carried out and the result was deemed significant if the P value obtained was  $< 0.05$ . The number of participant responses varied across the services recipients use. Fintech for: Bank Account 22, Payment Servicing 72, Both 36, None 31s (Figure 15)

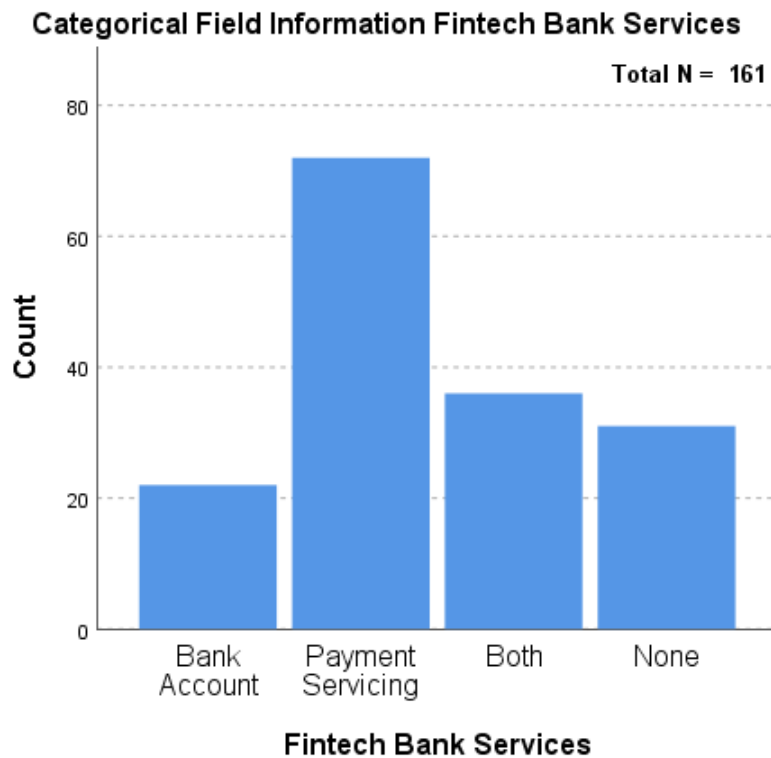


Figure 15 *Categorical Field Information FinTech Bank Services*

**Table 23 Fintech Hypothesis Test Summary**

	<b>Null Hypothesis</b>	<b>Test</b>	<b>Sig.</b>	<b>Decision</b>
<b>H3a</b>	The distribution of Actual usage is the same across categories of Fintech Bank Services.	Independent-Samples Kruskal-Wallis Test	0.000	Reject the null hypothesis.
<b>H3b</b>	The distribution of Social Norms (BE) is the same across categories of Fintech Bank Services.	Independent-Samples Kruskal-Wallis Test	0.404	Retain the null hypothesis.
<b>H3c</b>	The distribution of User Design is the same across categories of Fintech Bank Services.	Independent-Samples Kruskal-Wallis Test	0.568	Retain the null hypothesis.
<b>H3d</b>	The distribution of Perceived Risk is the same across categories of Fintech Bank Services.	Independent-Samples Kruskal-Wallis Test	0.496	Retain the null hypothesis.
<b>H3e</b>	The distribution of Instant Mobile Functionality is the same across categories of Fintech Bank Services.	Independent-Samples Kruskal-Wallis Test	0.691	Retain the null hypothesis.

H3a: Non Parametric Tests (Kruskal-Wallis Test) between Fintech Services and Actual Usage

H3a: Null Hypothesis: There is no significant difference in responses by those who use different fintech's services on digital banking actual usage

Alternative Hypothesis: There is a significant difference in responses by those who use different fintech's services on digital banking actual usage

Table 24 *Independent-Samples Kruskal-Wallis Test Summary*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	21.203 <sup>a</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.000
<b>a. The test statistic is adjusted for ties.</b>	

The Kruskal-Wallis H test showed that there was a statistically significant difference in score between the different age levels, Kruskal-Wallis H = 21.203, p = 0.000, (Table 24) with a mean rank actual usage of 78.39 for those who have use both payments & bank account services ranging to 113.84 mean rank for respondents who don't use FinTech's. The data rejects the null hypothesis as there is there is at least one difference in actual usage among different fintech users' categories.

By analysing the Pairwise Comparisons of Age table the breakdown of the statistically significant difference between (Both-None), (Payment Servicing-None),(Bank Account-None), (Table25 )

Table 25 Pairwise Comparisons of Fintech Bank Services

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.
Both-Payment Servicing	12.826	9.515	1.348	0.178
Both-Bank Account	14.831	12.614	1.176	0.240
Both-None	-50.283	11.421	-4.403	0.000*
Payment Servicing-Bank Account	2.004	11.355	0.177	0.860
Payment Servicing-None	-37.457	10.013	-3.741	0.000*
Bank Account-None	-35.452	12.994	-2.728	0.006*

Table 26 FinTech Banking Services mean rank

Fintech Bank Services	N	Mean Rank
Actual usage	Bank Account	78.39
	Payment Servicing	76.38
	Both	63.56
	None	113.84
	Total	161

### H3b-e: Non-Parametric Tests (Kruskal-Wallis Test) between Fintech Services and Social Norms, User Design, perceived Risk and Instant Mobile Functionality

H3b: Null Hypothesis: There is no significant difference in responses who use fintech's on the influence of Social Norms.

Alternative Hypothesis: There a significant difference in responses who use fintech's on the influence of Social Norms.

H3c: Null Hypothesis: There is no significant difference in responses who use fintech's on digital banking User Design

Alternative Hypothesis: There is a significant difference in responses who use fintech's on digital banking User Design

H3d: Null Hypothesis: There is no significant difference in responses who use fintech's on digital banking Perceived Risk

Alternative Hypothesis: There is a significant difference in responses who use fintech's on digital banking Perceived Risk

H3e: Null Hypothesis: There is no significant difference in responses who use fintech's on the perception of digital banking Instant Mobile Functionality

Alternative Hypothesis: There is a significant difference in responses who use fintech's on the perception of digital banking Instant Mobile Functionality

The Kruskal-Wallis H test showed that there was no statistically significant difference in Social norms, User Design, Perceived Risk, and Instant Mobile functionality for Fintech Service differences. The Kruskal-Wallis H test showed that there statistically significant difference:

- Social norms Kruskal-Wallis H (4)2.92, Significance P= 0.404 (Table 27)
- User Design Kruskal-Wallis H (4) 2.387, Significance p = 0.49 (Table 28)
- Perceived Risk Kruskal-Wallis H (4) 2.387, Significance p = 0.49 (Table 29)
- Instant Mobile functionality Kruskal-Wallis H (4) 1.464 Significance, p = 0.69 (Table 30)

Based on the analysis the findings fail to reject the null hypothesis so there is no difference in resonance based of their fintech services for Social norms, User Design, Perceived Risk, and Instant Mobile functionality.

Table 27 Social Norms (BE) across Fintech Bank Services

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	<b>161</b>
<b>Test Statistic</b>	<b>2.920<sup>a,b</sup></b>
<b>Degree Of Freedom</b>	<b>3</b>
<b>Asymptotic Sig.(2-sided test)</b>	<b>0.404</b>
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 28 User Design across FinTech Bank Services

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	<b>161</b>
<b>Test Statistic</b>	<b>2.022<sup>a,b</sup></b>
<b>Degree Of Freedom</b>	<b>3</b>
<b>Asymptotic Sig.(2-sided test)</b>	<b>0.568</b>
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 28 Perceived Risk across Fintech Bank Services

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	<b>161</b>
<b>Test Statistic</b>	<b>2.387<sup>a,b</sup></b>
<b>Degree Of Freedom</b>	<b>3</b>
<b>Asymptotic Sig.(2-sided test)</b>	<b>0.496</b>
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 30 *Instant Mobile Functionality across FinTech Bank Services*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	1.464 <sup>a,b</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.691
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 31 *Actual Usage across FinTech Bank Services*

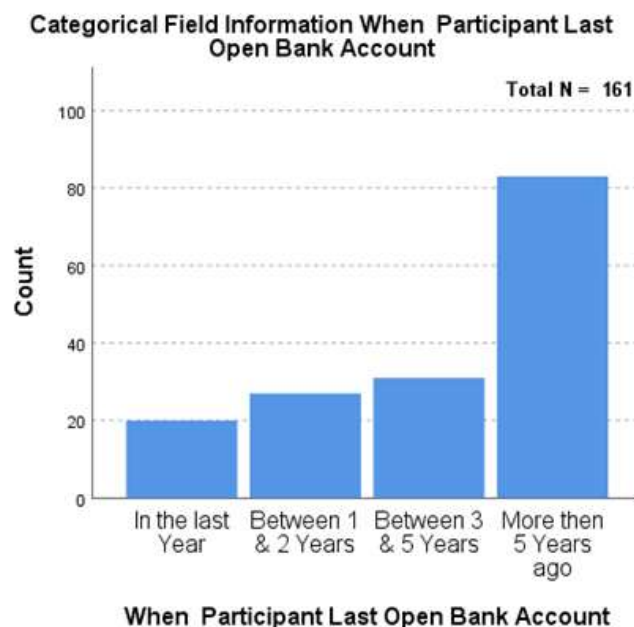
<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	21.203 <sup>a</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.000
<b>a. The test statistic is adjusted for ties.</b>	

### **When Bank account was opened analysis**

The effect of a range of direct variables: Actual usage (H2a), Social Norms (H2b), User Design (H2c), Perceived Risk (H2d) and Instant Mobile Functionality (H2e) (Table 32) on the independent variable age demographic was examined. Statistical analysis was performed, Kruskal-Wallis Test H was carried out and the result was deemed significant if the P value obtained was < 0.05. The number of participant responses varied across time as follows; In the last Year 20, Between 1 & 2 Years 27, Between 3 & 5 Years 31, More than 5 Years ago 83. (Figure 16)

Table 32 *When Bank account was opened Hypothesis Test Summary*

Hypothesis ID	Null Hypothesis	Test	Sig.	Decision
H4a	The distribution of Actual usage is the same across categories of When Participant Last Open Bank Account.	Independent-Samples Kruskal-Wallis Test	0.001	Reject the null hypothesis.
H4b	The distribution of Social Norms (BE) is the same across categories of When Participant Last Open Bank Account.	Independent-Samples Kruskal-Wallis Test	0.216	Retain the null hypothesis.
H4c	The distribution of User Design is the same across categories of When Participant Last Open Bank Account.	Independent-Samples Kruskal-Wallis Test	0.499	Retain the null hypothesis.
H4d	The distribution of Perceived Risk is the same across categories of When Participant Last Open Bank Account.	Independent-Samples Kruskal-Wallis Test	0.688	Retain the null hypothesis.
H4e	The distribution of Instant Mobile Functionality is the same across categories of When Participant Last Open Bank Account.	Independent-Samples Kruskal-Wallis Test	0.736	Retain the null hypothesis.

Figure 16 *Categorical Field Information when participant last opened bank account.*

**H4a: Non Parametric Tests (Kruskal-Wallis Test) between when an account was open and Actual Usage**

H3a: Null Hypothesis: There is no significant difference in responses by those who opened their bank accounts at different times

Alternative Hypothesis: There is a significant difference in responses by those who opened their bank accounts at different times

Table 33 *Actual usage across When Participant Last Open Bank Account*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	16.48 <sup>a</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.001
<b>a. The test statistic is adjusted for ties.</b>	

The Kruskal-Wallis H test showed that there was a statistically significant difference in score between the different age levels, Kruskal-Wallis  $H = 16.48^a$ ,  $p = 0.001$ , (Table 33) with a mean rank actual usage of 61.55 for those who opened there account between 3 to 5 years raging to 95.27 mean rank for opened their account more than 5 years ago. The data rejects the null hypothesis as there is there is at least one difference in actual usage among difference in time buckets.

Table 34 *Actual Usage Mean Ranks*

When Participant Last Open Bank Account		N	Mean Rank
<b>Actual Usage</b>	In the last Year	20	71.55
	Between 1 to 2 Years	27	62.69
	Between 3 to 5 Years	31	64.85
	More then 5 Years ago	83	95.27
	Total		161

By analysing the Pairwise Comparisons of Age table the breakdown of the statistically significant difference between (Between 3 & 5 Years-More then 5 Years ago),( Between 1 & 2 Years-More then 5 Years ago), (Table 35)

Table 35 *Pairwise Comparisons of When Participant Last Opened a Bank Account*

Time	Test Statistic	Std. Error	Std. Test Statistic	Sig.
<b>Between 1 &amp; 2 Years- Between 3 &amp; 5 Years</b>	-2.170	12.271	-0.177	0.860
<b>Between 1 &amp; 2 Years- In the last Year</b>	8.865	13.752	0.645	0.519
<b>Between 1 &amp; 2 Years- More then 5 Years ago</b>	-32.580	10.327	-3.155	0.002*
<b>Between 3 &amp; 5 Years- In the last Year</b>	6.695	13.369	0.501	0.617
<b>Between 3 &amp; 5 Years- More then 5 Years ago</b>	-30.410	9.812	-3.099	0.002*
<b>In the last Year-More then 5 Years ago</b>	-23.715	11.611	-2.042	0.041

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

### **H3b-e: Non Parametric Tests (Kruskal-Wallis Test) between Fintech Services and Social Norms, User Design, perceived Risk and Instant Mobile Functionality**

H3b: Null Hypothesis: There is no significant difference in responses who use fintech's on the influence of Social Norms.

Alternative Hypothesis: There a significant difference in responses who use fintech's on the influence of Social Norms.

H3c: Null Hypothesis: There is no significant difference in responses who use fintech's on digital banking User Design

Alternative Hypothesis: There is a significant difference in responses who use fintech's on digital banking User Design

H3d: Null Hypothesis: There is no significant difference in responses who use fintech's on digital banking Perceived Risk

Alternative Hypothesis: There is a significant difference in responses who use fintech's on digital banking Perceived Risk

H3e: Null Hypothesis: There is no significant difference in responses who use fintech's on the perception of digital banking Instant Mobile Functionality

Alternative Hypothesis: There is a significant difference in responses who use fintech's on the perception of digital banking Instant Mobile Functionality

The Kruskal-Wallis H test showed that there was no statistically significant difference in Social norms, User Design, Perceived Risk, and Instant Mobile functionality for Fintech Service differences. A Kruskal-Wallis H test showed that there statistically significant difference:

- Social norms Kruskal-Wallis H (4)4.46 Significance P= 0.216 (Table36)
- User Design Kruskal-Wallis H (4) 2.371 , Significance p = 0.499 (Table37)
- Perceived Risk Kruskal-Wallis H (4) 2.477 , Significance p = 0.688 (Table38)
- Instant Mobile functionality Kruskal-Wallis H (4) 1.269 Significance , p = 0.736 (Table39)

Based on the analysis the findings fail to reject the null hypothesis so there is no difference in resonance based of their fintech services for Social norms, User Design, Perceived Risk, and Instant Mobile functionality.

Table 36 *Social Norms (BE) across When the Participant Last Open Bank Account*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	4.460 <sup>a,b</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.216
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 37 *User Design across When the Participant Last Open Bank Account*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	2.371 <sup>a,b</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.499
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 38 *Perceived Risk across When Participant Last Open Bank Account*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	1.477 <sup>a,b</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.688
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

Table 39 *Instant Mobile Functionality across When the Participant Last Open Bank Account*

<b>Independent-Samples Kruskal-Wallis Test Summary</b>	
<b>Total N</b>	161
<b>Test Statistic</b>	1.269 <sup>a,b</sup>
<b>Degree Of Freedom</b>	3
<b>Asymptotic Sig.(2-sided test)</b>	0.736
<b>a. The test statistic is adjusted for ties.</b>	
<b>b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.</b>	

### How a Bank account was opened analysis

The effect of a range of direct variables: Actual usage (H2a), Social Norms (H2b), User Design (H2c), Perceived Risk (H2d) and Instant Mobile Functionality (H2e) (Table x, Age hypothesis) on the independent variable age demographic was examined. Statistical analysis was performed, Mann-Whitney U Test was carried out and the result was deemed significant if the P value obtained was < 0.05. The number of participant responses varied across time period as follows; In person in Branch 109, Online/ Digitally 52

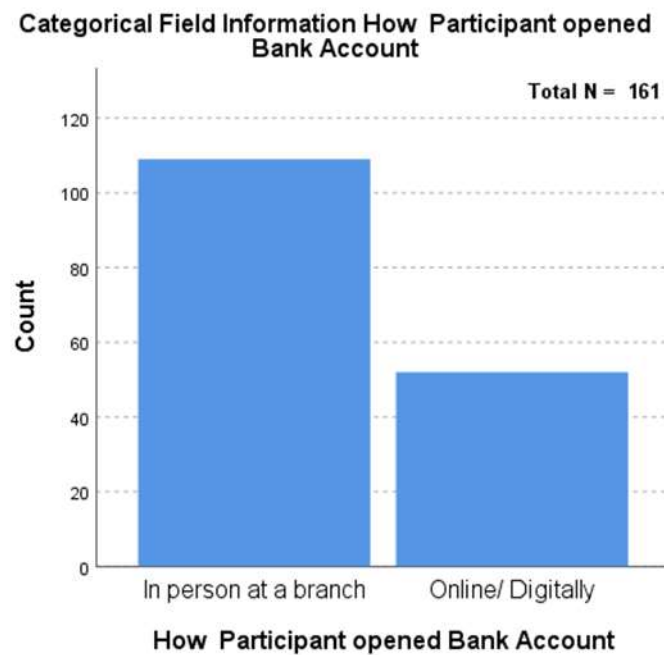


Figure 17 *Categorical field information how the participant opened the bank account.*

Table 40 *Hypothesis Test Summary*

	Null Hypothesis	Test	Sig.	Decision
<b>H5a</b>	The distribution of Actual usage is the same across categories of How Participant opened Bank Account.	Independent-Samples Mann-Whitney U Test	0.000	Reject the null hypothesis.
<b>H5b</b>	The distribution of Social Norms (BE) is the same across categories of How Participant opened Bank Account.	Independent-Samples Mann-Whitney U Test	0.048	Reject the null hypothesis.
<b>H5c</b>	The distribution of User Design is the same across categories of How Participant opened Bank Account.	Independent-Samples Mann-Whitney U Test	0.317	Retain the null hypothesis.
<b>H5d</b>	The distribution of Perceived Risk is the same across categories of How Participant opened Bank Account.	Independent-Samples Mann-Whitney U Test	0.921	Retain the null hypothesis.
<b>H5e</b>	The distribution of Instant Mobile Functionality is the same across categories of How Participant opened Bank Account.	Independent-Samples Mann-Whitney U Test	0.800	Retain the null hypothesis.

## H5a: Non Parametric Tests (Mann-Whitney U Test) between how an account was open and Actual Usage

H5a: Null Hypothesis: There is no significant difference in responses by those who opened their bank branch and those that did it online and actual usage

Alternative Hypothesis: Null Hypothesis: There is a significant difference in responses by those who opened their bank branch and those that did it online and actual usage

Mann-Whitney U Test showed that there was a statistically significant difference in score between the those who open bank accounts in a branch and those who do it online,  $p = 0.00$ , (Figure 18) The data rejects the null hypothesis as there is a difference between the variables.

- Actual Usage of Mean Rank in person 92.62 Online 56.64 (Figure 18 )  $P = 0.00$  (Table 40)

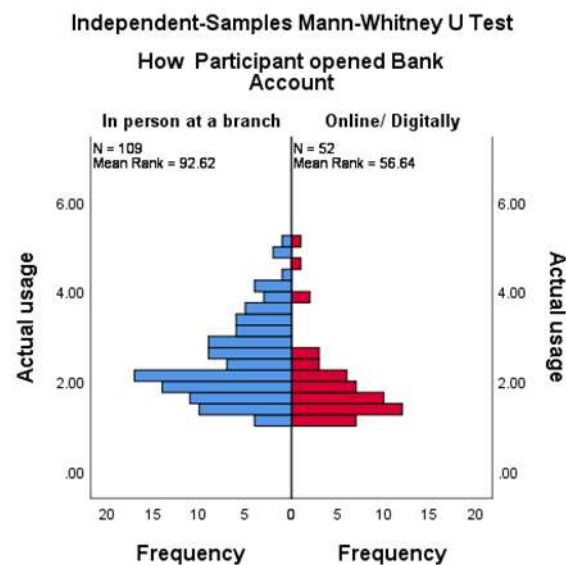


Figure 18 Mann Whitney U Test Actual Usage

### H5b: Non Parametric Tests (Mann-Whitney U Test ) between how an account was open and Social Norm

H5b: Null Hypothesis: There is no significant difference in responses by those who opened their bank branch and those that did it online and Social Norms.

Alternative Hypothesis: There is a significant difference in responses by those who opened their bank branch and those that did it online and Social Norms.

Mann-Whitney U Test showed that there was a statistically significant difference in score between the those who open bank accounts in a branch and those who do it online,  $p = 0.048$ , (Independent-Samples Mann-Whitney U Test Summary) The data rejects the null hypothesis as there is a difference between the variables.

- Social Norm of Mean Rank In person 85.82 Online 70.89 (Figure 19)  $P = 0.048$  (Table 40)

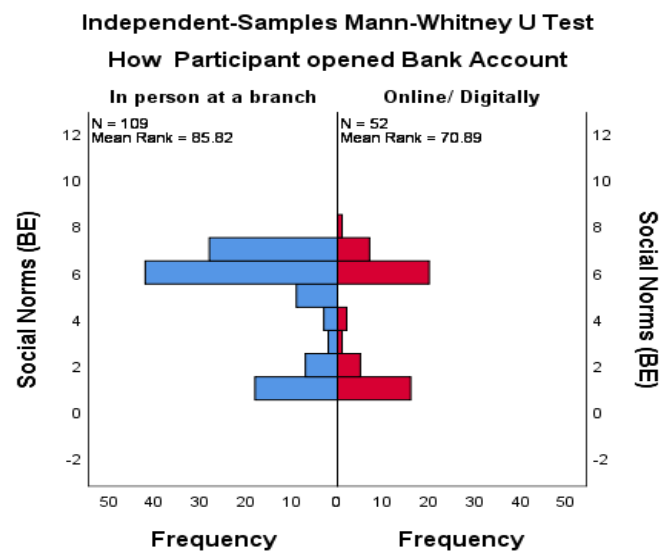


Figure 19 Mann Whitney U Test Social Norm

### **H5c,d,e: Non Parametric Tests (Mann-Whitney U Test ) between how an account was open and Actual Usage**

H5c: Null Hypothesis: There is no significant difference in responses by those who opened their bank branch and those that did it online and banking User Design

Alternative Hypothesis: There is a significant difference in responses by those who opened their bank branch and those that did it online and digital banking User Design

H5d: Null Hypothesis: There is no significant difference in responses by those who opened their bank branch and those that did it online and on digital banking Perceived Risk

Alternative Hypothesis: There is a significant difference in responses by those who opened their bank branch and those that did it online and digital banking Perceived Risk

H2e: Null Hypothesis: There is no significant difference in responses by those who opened their bank branch and those that did it online on the perception of digital banking Instant Mobile Functionality

Alternative Hypothesis: There is a significant difference in responses by those who opened their bank branch and those that did it online on the perception of digital banking Instant Mobile Functionality

The Independent-Samples Mann-Whitney U test showed that there was no statistically significant difference in User Design, Perceived Risk, and Instant Mobile functionality. Independent-Samples Mann-Whitney U showed a mean rank for:

- User Design of Mean Rank In person 83.51 Online 75.73 (Figure 20) P= 0.32 (Table 40)
- Perceived Risk Mean Rank In person 80.75 Online 81.52 (Figure 21) P= 0.92 (Table 40)
- Instant Mobile functionality Mean Rank In person 81.64 Online 79.66 (Figure 22) P= 0.80 (Table 40)

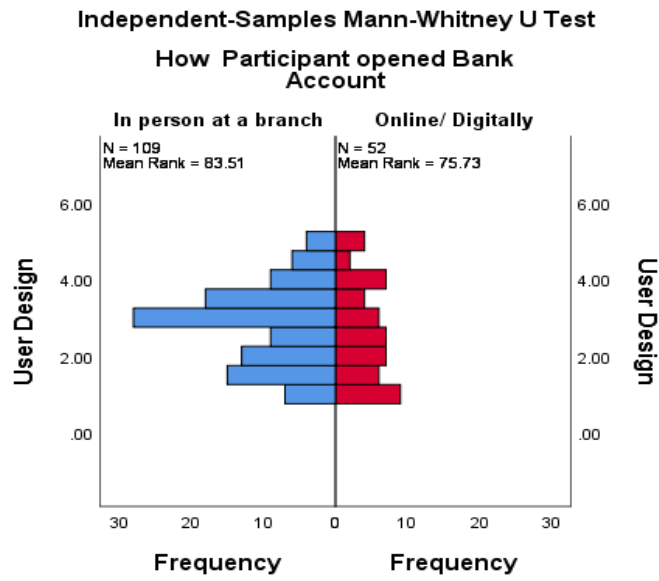


Figure 20 Mann Whitney U Test User Design

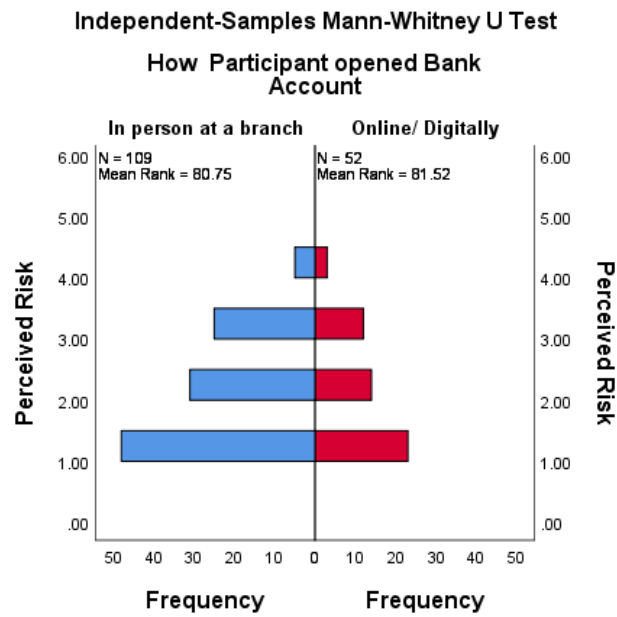


Figure 21 Mann Whitney U Test Perceived Risk

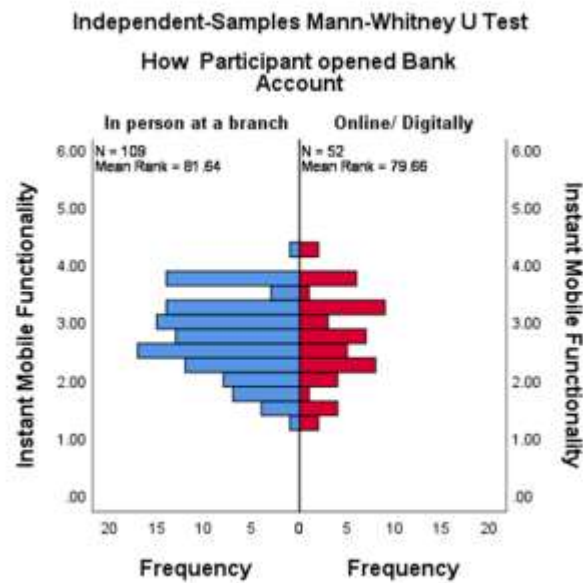


Figure 21 *Mann Whitney U Test Instant Mobile Functionality.*

Based on the analysis the findings fail to reject the null hypothesis so there is no difference in User Design, Perceived Risk, and Instant Mobile functionality on how a bank account was opened.

Table 41 *Traditional Bank How the Participant opened Bank Account*

		How Participant opened Bank Account		Total
		In person at a branch	Online/ Digitally	
<b>Traditional Bank</b>	Bank Account	36	17	53
	Payment Servicing	0	1	1
	Both	73	32	105
	None	0	2	2
<b>Total</b>		109	52	161

## Discussion

The aim of this research was to identify the factors that influence digital banking actual usage and adoption of digital banking in Ireland while also getting an understand the role Fintech operators are having on it. This chapter will outline the main findings and discuss the results ascertained from the data analysis. The literature review highlighted the impact digital banking is having on the Banking industry globally and in Ireland. FinTech's have had a major bearing on this and have driven the technology enhancement agenda. They have used the advantages of focusing on niche product offering and scale to eat into the profits of Traditional banks

### Summary of Findings

The first observation from the findings was the positive responses provided from the participants in relation to the TAM aspects of the questioner. Using a Likert scale with 3 being the neutral response, all the TAM variable mean data skewed Positive: (PE) 2.0807, (PU) 2.4224, (AT) 2.1014, (BI) 2.5445, (SE) 2.1843, (SN) 2.29, with an overall positive score for Actual usage of 2.2698 (Table 4). This is indicative of a positive environment for Digital banking operators.

The variables contained on the behavioural adoption again skewed positive for User Social Norms 2.326, User Design 2.7733 & Instant Mobile Functionality 2.7299. However, the area that scored highest was the Perceived Risk 2.0817. The perceived Risk scoring higher than Instant mobile indicates there are areas of concerns and potential reluctance to adopt

for certain products. The hypothesis testing showed there are significant variances in the actual usage of Digital banking across different demographic and user groups.

### **Finding Age**

The analysis in relation to Age, shows there is a significant variance across age groups for actual usage. The pairwise comparison (Table 11) identifies 16 variances, 5 of these relate to the 66+ age cohort with the remainder spread across grouping. Each have the mean ranking is lower and therefore more favourable to actual usage of digital banking than the older grouping. Significantly the age variations seem to top out at the 30-34 and up with no significant variation accruing between that age cohort and any young ones but 5 with older ones. This indicates those 35 have a consistently higher actual usage for digital banking than those older. This finding fits with the literature which found a lot using the TAM model that millennials scored high on actual usage (Mun *et al.* 2017).

As the hypothesis that age impacts on the actual usage of digital banking. This presents several challenges traditional Banking who will look to drive clients away from the more costly in person channels to digital engagement channels.

The second Hypothesis that held related to the difference in social norms or what impacts upon respondents when opening accounts. The influence of social element more important to a younger age grouping, with Friend recommendation being the most important factor in the age ranges from 18-35, with personal research the key variable for the older groupings (Figure 22).

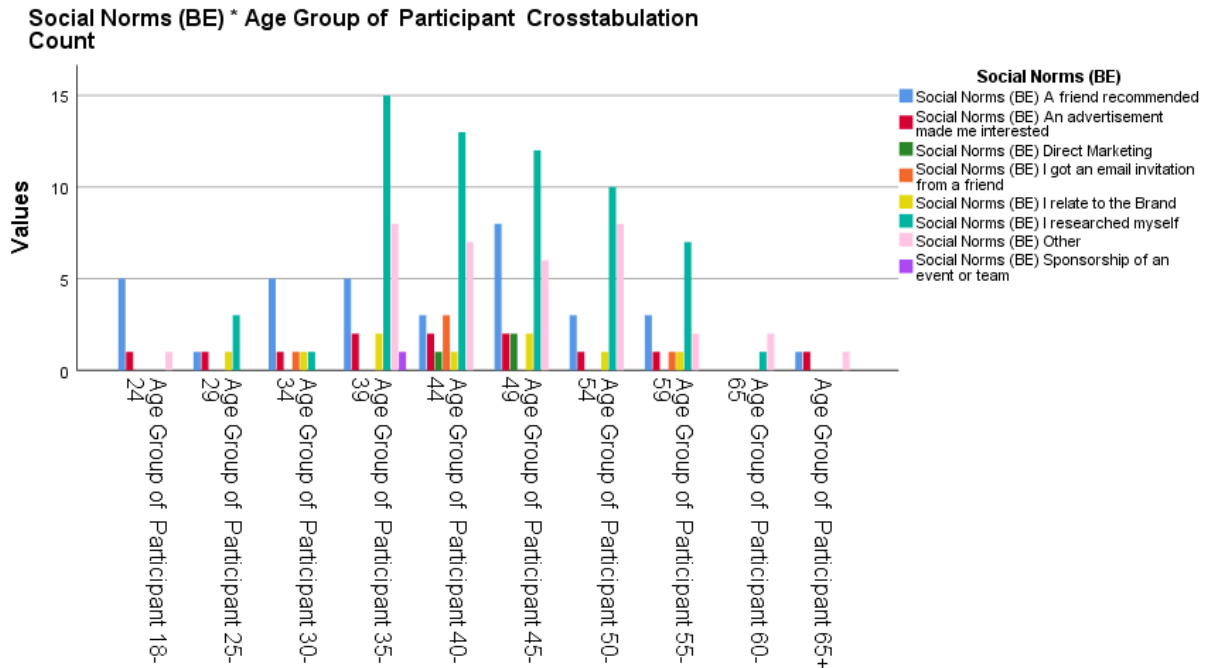


Figure 22 Social Norms age groups.

The surprise result related to hypothesis H1d Perceived Risk showed no statistically significant difference between different agree groupings. Given previous research related to millennials comfort levels operating online banking (Hussain & Clairnce, 2015) a variance was expected.

For FinTech the challenge is different in how they engage with this segment of the market, there current strategies have been focused on the growing client base with consumers with younger age profile. To continue to grow and expand their clients bases different strategies targeting an older cohorts would be recommended based on these finding.

## Findings for Fintech

The finding shows that the fintech penetration amongst the response is extremely high with over 80% having at least one service with a Fintech operator (figure 15). This is a positive sign for the markets as Banks numbers contract this indicates FinTech's are capitalising on this to some extent.

When the actual usage of digital banking was measured across the different categories it showed significant variance existed. Pairwise Comparisons showed (Both-None), (Payment Servicing-None), (Bank Account-None) all had significant variances and in each case those without a FinTech services had a higher mean score indicating lower actual usage of Digital banking (Table 25). The largest variances came from the scores provided by those who don't use any Fintech services having a significantly lower score for Digital banking actual usage then those who use FinTech's for any services. Consistent with the research from Sikdar *et al.*, (2015) and Hu *et al.*, (2019) different customer requirements should be to be central to the technology developments of user platforms for a wide adoption level.

## Other Findings

The analysis performed for gender showed there was no significant findings, across each of the direct variables, there was no significant variances between male and female respondents. When a bank account was open also had a significant impact on actual usage with those who opened accounts more than 5 years ago having significantly lower score then respondents who have opened account more recently.

By analysing the Pairwise Comparisons of age table the breakdown of the statistically significant difference between (Between 3 & 5 Years-More than 5 Years ago), (Between 1 &

2 Years-More than 5 Years ago), (Table 35). The findings show those who have opened accounts more recently have a higher rate of actual usage then those have haven't opened an account for five years. When cross tabulated the respondents who don't have any Fintech accounts opened their accounts the over 5-year period (Figure 23)

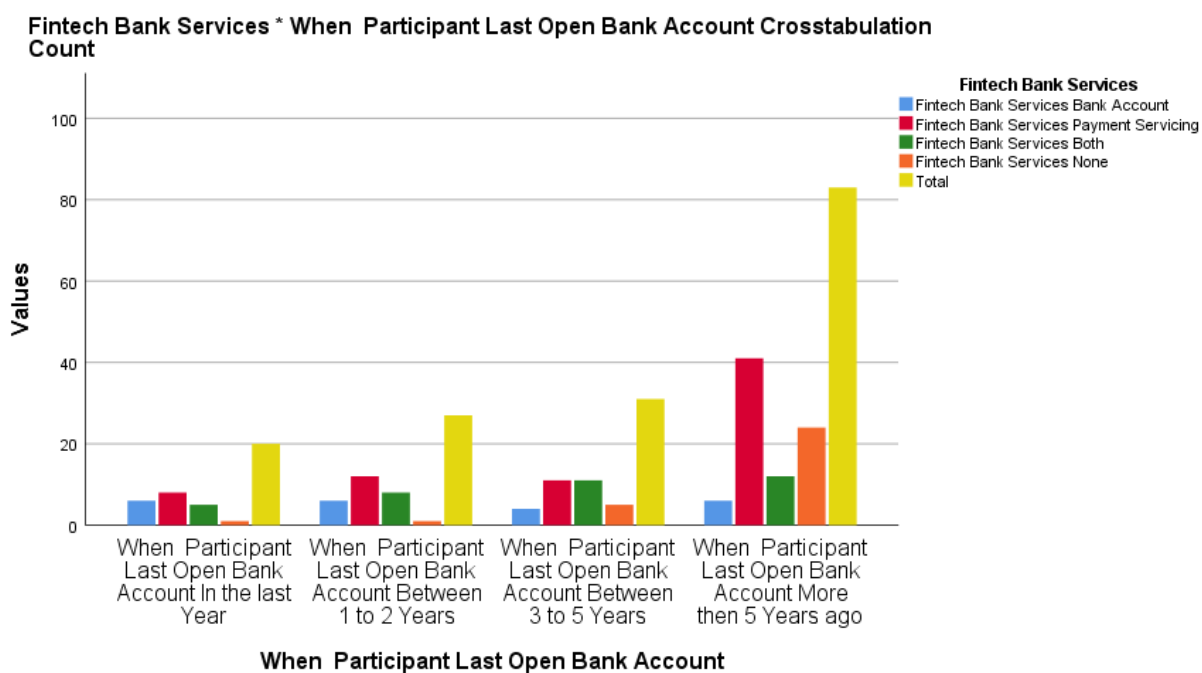


Figure 23 FinTech when participant last opened bank account.

The study showed that there was a statistically significant difference in score between the those who open bank accounts in a branch and those who do it online and their digitalisation actual usage. This is an area banks have struggled with due to the complexities on their onboarding process and the KYC requirements. Traditional Banks have a two to one ration of customers opening account in branch rather the online (Table 41). In additional the results showed that there was a statistically significant difference in score between the those who open bank accounts in a branch versus those who did it online and what influenced them to open the account. (figure24) The influence of friend recommendation having a more

prevalence for those who opened their account online. This is consistent with the Social Norm aspect of digital nudging (Benartzi, 2017).

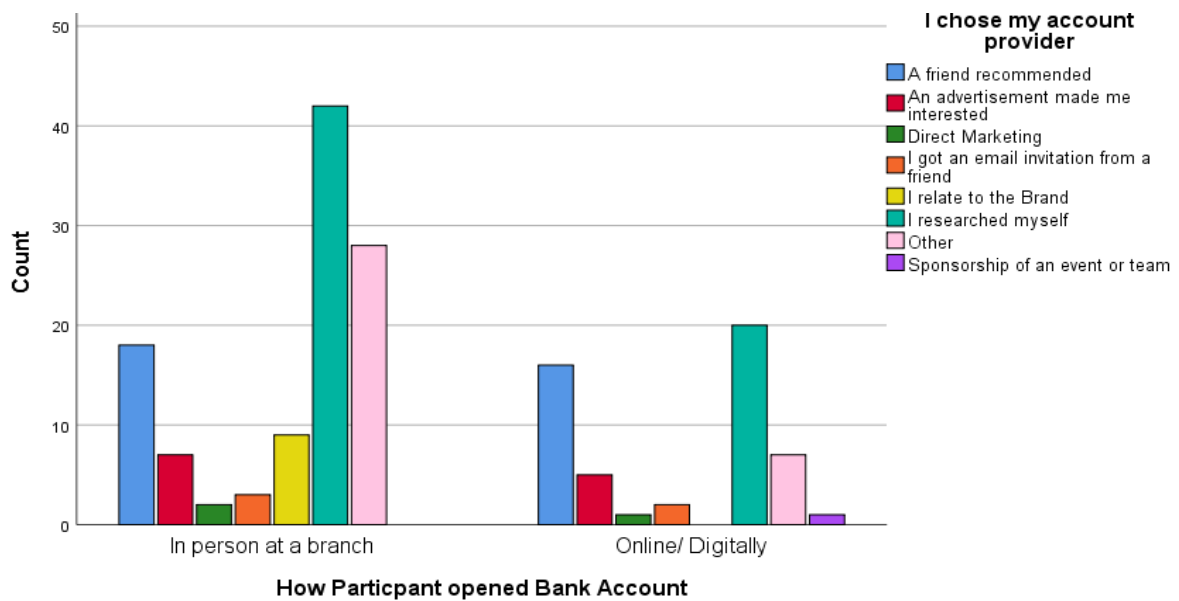


Figure 24 what influenced participants when opening an account

### Limitation of the research

The use of personal networks and social media to gather respondents had an impact on how the data was skewed, for one by using the digital channels and having the question a bias the results in favour of those who are comfortable using online platforms. In addition, the age profile of the respondents mirrors my own age with most respondents coming in the age groupings close to my own. A recommendation for further research is to conduct the study with a broader sample that is more reflective of the Irish population as a whole. Having additional demographic questions should allow for more cross comparative calculations.

On reflection asking a question related to the usage of FinTech accounts would have added value, this would help ascertain if FinTech providers are being used as a supplementary to major banks and what the penetration into being the primary accounts for the resonance was. This is an area that will be important for future analysis and studies.

Finally, it would be valuable to understand how actual usage and adoption change over time. As digital technology continues to develop with additional functionalities and new products how consumers interact and the speed, they embrace these new technologies will determine the future for the retail banking industry

### Recommendations for Industry

With the results showing favourable view towards digitisations usage, it also highlights this is not uniform across all demographics specifically different age groups. Similarly, the findings show a considerable number opened their bank accounts in person. Industry needs to review at how it engages with different demographics and focus on making digital products simple to engage with and user-friendly options.

Nudging generally not distinguishable between Traditional Banks and FinTech. While Fintech have developed solutions such as emails recommendations, single source accounts and instant mobile that are aligned to the digital nudging framework these do not seem to be having an impact in the perception of the respondents. A recommendation for traditional Banks is to respond by developing solution that can counter the Fintech use of these techniques before they become a critical competitive advantage in the eyes of the consumer.

## Final considerations

The research has shown a range of interesting results some expected and in line with research in other markets and some unique to this research given the areas of focus. Digital banking has progressed rapidly over the last decade in Ireland however there are several issues that have delayed its implementation. The reliance on in persons branch visits to open accounts physical original copy documents puts them at a disadvantage to FinTech operators. The penetration levels of FinTech's in Ireland are impressive particularly in the younger age cohorts, those who open their accounts online and those who opened accounts more recently. These are all positive indicators that the sector taking business for traditional banks and will continue to do so until there is greater levels of digitisation and automation implemented by traditional banks.

The area of perceived risk across Digital banking is a potential barrier to its expansion greater protections such as PSD2 may go some way to assist with this, however if this is not addressed through greater security measures and education it has the potential to slow the progress of banking digitisation as it expands to other products.

## Bibliography

Ajibade, P. (2018). "Technology Acceptance Model Limitations and Criticisms: Exploring the Practical Applications and Use in Technology-related Studies, Mixed-method, and Qualitative Researches." University of KwaZulu-Natal.

Alt, R., Beck, R. and Smits, M. T. (2018) 'FinTech and the transformation of the financial industry', *Electronic Markets*, 28(3), pp. 235-243.

Alavi, M., & Joachimsthaler, E. A. (1992). Revisiting DSS implementation research: A metaanalysis of the literature and suggestions for researchers. *MIS Quarterly*, 16(1), pp. 95–116.

Barba, R. and Macheel, T., (2016). Banks play growing role in funding FinTech. *American Banker*. Available at: <https://www.americanbanker.com/news/banks-play-growing-role-in-funding-fintech>. Accessed on 28<sup>th</sup> August 2021.

Benbasat, Izak & Barki, Henri. (2007). "Quo vadis, TAM?," *Journal of the Association for Information Systems*, 8(4), pp.211 – 218.

Benartzi, S. (2017) "How Digital Tools and Behavioural Economics Will Save Retirement". *Harvard Business Review*, Behavioural Economics. Available at <https://hbr.org/2017/12/how-digital-tools-and-behavioral-economics-will-save-retirement>. Accessed on 29th August 2021.

Berger, R. (2015) Executive Retail Banking Survey: Digital Transformation. Available at [https://www.rolandberger.com/publications/publication\\_pdf/roland\\_berger\\_executive\\_retail\\_banking\\_survey\\_digital\\_transformation.pdf](https://www.rolandberger.com/publications/publication_pdf/roland_berger_executive_retail_banking_survey_digital_transformation.pdf). Accessed on 17th April 2020.

Blumenthal, M., C. Christian, J. Slemrod, and M. G. Smith, "Do Normative Appeals Affect Tax Compliance? Evidence from a Controlled Experiment in Minnesota," *National Tax Journal*, 2001, 54 (1), pp. 125–138.

Blut, M. 2016. "E-Service Quality: Development of a Hierarchical Model". *Journal of Retailing*, 92 (4) pp. 500 – 517.

Broeders, H. and Khanna, S., (2015). "Strategic choices for banks in the digital age". [online] McKinsey & Company: Our Insights. Available at: [www.mckinsey.com/industries/financial-services/our-insights/strategic-choices-for-banks-in-the-digital-age](http://www.mckinsey.com/industries/financial-services/our-insights/strategic-choices-for-banks-in-the-digital-age). Accessed on 24th August 2021.

Brown, C., & Krishna, A. (2004). The Skeptical Shopper: A Metacognitive Account for the Effects of Default Options on Choice. *Journal of Consumer Research*, 31(3), pp. 529–539.

Buss, A., Freeborn, L., and Silva, J., (2016). "The digital-ready bank: How ready are European banks for a digital world". [online] IDC Financial Insights. Available at: <http://news.sap.com/wp-content/blogs.dir/1/files/IDC-WP-Digital-Transformation-inBanking-Final.pdf>. Accessed on 24th August 2021.

Cai, C.W. (2020), "Nudging the financial market? A review of the nudge theory". *Account Finance*, 60, pp. 3341-3365.

Central Bank of Ireland (2019) "Key Trends on Current Account Activity and Switching". Available at <https://www.centralbank.ie/news-media/press-releases/press-release-consumer-protection-bulletin-20-june-2019>. Accessed on 12<sup>th</sup> September 2021.

Chou, S., Shen, G. C., Chiu, H., and Chou, Y. (2016). "Multichannel service providers' strategy: Understanding customers' switching and free-riding behavior." *Journal of Business Research* 69(6), pp. 2226–2232.

Cialdini RB, Trost MR (1998). Social influence: social norms, conformity and compliance. In: Gilbert DT, Fiske ST, Lindzey G, editors. *The Handbook of Social Psychology*. 4. 1 and 2. McGraw-Hill; New York, NY: pp. 151–192.

Compeau, D. R., and Higgins, C. A. (1995). Application of social cognitive theory to training for computer skills. *Information Systems Research*, 6(2), pp. 118–143.

Cziesla, T. 2014. "A Literature Review on Digital Transformation in the Financial Service Industry," BLED 2014 Proceedings, Paper 18.

Davis, F.D. (1986) "A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results". Sloan School of Management, Massachusetts Institute of Technology.

Davis, F.D. (1989) "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology" *MIS Quarterly* 13(3), pp. 319-340.

Davis, F.D. (1993) "User Acceptance of Information Technology System Characteristics, User Perceptions and Behavioral Impacts" *International Journal of Man-Machine Studies* 38(3), pp. 475-487.

Dawson, J. (2017). *Analysing Quantitative Survey Data for Business and Management Students*. London, Sage Publications Ltd.

De Guinea, Ana Ortiz and Markus, M. Lynne. (2009). "Why break the habit of a lifetime? rethinking the roles of intention, habit, and emotion in continuing information technology use". *MIS Q.* 33(3), pp. 433–444.

De Keyser, A., Schepers, J., and Konuş, U. (2015). "Multichannel customer segmentation: Does the after-sales channel matter? A replication and extension." *International Journal of Research in Marketing* 32(4), pp. 453–456.

Dillman, D., J. Smyth and L. M. Christian (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*, 4th Edition.

Dootson, P., Beatson A. and Drennan, J. (2016), "Financial institutions using social media – do consumers perceive value?", *International Journal of Bank Marketing*. 34 (1) pp. 9-36.

Eurostat (2019) Payment Security Concerns. Available at <https://ec.europa.eu/eurostat/documents/4187653/10321583/Payment+security+concerns> Accessed on 17th September 2021.

Eurostat (2020) Individual Frequency of internet use. Available at [https://ec.europa.eu/eurostat/databrowser/view/ISOC\\_CI\\_AC\\_I/bookmark/line?lang=en&bookmarkId=50878c5a-1eda-4f96-aa38-2fedcc43dc33](https://ec.europa.eu/eurostat/databrowser/view/ISOC_CI_AC_I/bookmark/line?lang=en&bookmarkId=50878c5a-1eda-4f96-aa38-2fedcc43dc33). Accessed on 16th September 2021.

Evans-Pritchard, B., (2013) "Aiming To Reduce Cleaning Costs" Available at <https://worksthatwork.com/1/urinal-fly> Accessed on 20th August 2021.

Ensor, T., Green, C., Quigley, P., Badru, A. R., Kaluba, D., & Kureya, T. (2014). "Mobilizing communities to improve maternal health: results of an intervention in rural Zambia". *Bulletin of the World Health Organization*, 92(1), pp. 51–59.

Faccia, A., Moşteanu, N. R., Cavaliere L. P. L. and De Santis, G. (2020) "The rise of online banks in Italy "WIDIBA Bank" Case Study". *Financial Markets, Institutions and Risks*, 4(2), pp. 80 -97.

Fang, X. and Zhan, J. (2010) "Online banking authentication using mobile phones". In 5th International Conference on Future Information Technology, IEEE, South Korea, pp. 1-5.

FCA (2021a) FCA Handbook – Client Bank account Available at <https://www.handbook.fca.org.uk/handbook/glossary/G159.html>. Accessed on 28th August 2021.

FCA (2021b) FCA Handbook - Payment service. Available at EG 19.22 Decision making under the Payment Services Regulations - FCA Handbook. Accessed on 3rd September 2021

Fishburn, Peter C. (1976) "Utility Theory". *Management Science*. 14(5), pp. 335-378.

Frey, B. B. (2018). "The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation."

Gabor, D.; Brooks, S. (2017) "The Digital Revolution in Financial Inclusion: International Development in the Fintech Era". *New Polit. Econ.*, 22 (4), pp. 423-436.

Gartner (2021) Gartner Glossary Available at: <https://www.gartner.com/en/information-technology/glossary/digitalization>. Accessed on 8<sup>th</sup> August 2021.

Gensler G (2012) "The New Era of Swaps Market Reform" Posted by the Harvard Law School Forum on Corporate Governance & Financial Regulation. Available at <https://corpgov.law.harvard.edu/2012/11/05/the-new-era-of-swaps-market-reform>. Accessed on 24<sup>th</sup> August 2021.

Ghani, M. A., Rahi, S., and Yasin, N. M. (2017). Adoption of Internet Banking: Extending the Role of Technology Acceptance Model (TAM) with E-Customer Service and Customer Satisfaction. *World Applied Sciences Journal*, 35(9), pp. 1918–1929.

Glas, A. and Truszal, M. (2016) 'Current Trends in Financial Technology', In: *The FINTECH Book: The Financial Technology Handbook for Investors, Entrepreneurs and Visionaries*, edited by S. C. Barberis and Janos Barberis pp. 13 – 15.

Gomber, P., Kauffman, R., Parker, C. and Weber, B. (2018) 'On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services', *Journal of Management Information Systems*, 35, pp. 220-265.

Graupner, E., Melcher, F., Demers, D. and Maedche, A. 2015. "Customers' Intention to Use Digital Services in Retail Banking - An Information Processing Perspective," *ECIS 2015*, Münster, Paper 61.

Grebe, M., Mönter, N., Noakes, B., de T'Serclaes, J.-W., Wade, B., and Walsh, I., (2016a). Customers steer digital trends driving retail bank transformation. [online] BCG Perspectives. Available at: [www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-customers-steer-digital-trends-driving-retailbank-transformation/](http://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-customers-steer-digital-trends-driving-retailbank-transformation/). Accessed 28<sup>th</sup> August 2021.

Grebe, M., Mönter, N., Noakes, B., de T'Serclaes, J.-W., Wade, B., and Walsh, I., 2016b. Global retail banking 2016: Banking on digital simplicity. [online] BCG Perspectives. Available at: [www.bcgperspectives.com/content/articles/financial-institutions-technologydigital-banking-digital-simplicity-global-retail-banking-2016/](http://www.bcgperspectives.com/content/articles/financial-institutions-technologydigital-banking-digital-simplicity-global-retail-banking-2016/) Accessed 28<sup>th</sup> August 2021.

Hai, Le Chi and Alam Kazmi, Syed Hasnain (2015). Dynamic Support of Government in Online Shopping. *Asian Social Science*. 11. pp. 1-9.

Hearne, John (2020) "Revamped bank charges: It pays to shop around" *Irish Examiner*. Available at <https://www.irishexaminer.com/business/economy/arid-40038689.html> Accessed on 16<sup>th</sup> September 2021.

Henseler, J., C. M. Ringle and M. Sarstedt (2015). "A new criterion for assessing discriminant validity in variance-based structural equation modeling." *Journal of the Academy of Marketing Science*, 43(1), pp. 115-135.

Hu, Z., Ding, S., Li, S., Chen, L., and Yang, S. (2019). "Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model". *Symmetry*. 11(340) pp. 1 – 16.

Hummel, D., Schacht, S., & Maedche, A. (2017). "Designing adaptive Nudges for Multi-channel Choices of Digital Services: a Laboratory Experiment Design". in *Proceedings of the Twenty-Fifth European Conference on Information Systems (ECIS)*, Guimarães, Portugal, June 2017.

Hussain, Mahmood and Wong, Clarice (2015) "The Online Banking Behavior of Generation Y" *SSRN Electronic Journal*. Available at <https://ur.booksc.eu/book/72955789/3b6138>. Accessed on 20th September 2021.

Jiwasiddi, A., Adhikara, C., Adam, M., and Triana, Ika. (2019). "Attitude toward using Fintech among Millennials". *Conference: Proceedings of The 1st Workshop Multimedia Education, Learning, Assessment and its Implementation in Game and Gamification, Medan Indonesia, 26th January 2019, WOMELA-GG*

Jolly, Vidhya. (2016). *The Influence of Internet Banking on the Efficiency and Cost Savings for Banks' Customers*. *International Journal of Social Sciences and Management*. 3 pp 163 – 170.

Kahneman, D. and Tversky, A. (1979). "Prospect theory: an analysis of decision under risk" *Econometrica*, 47(2), pp. 263-291.

Kang, H., Lee, M.J. and Lee, J.K. (2012) "Are you still with us? A study of the post-adoption determinants of sustained use of mobile-banking services". *Journal of Organizational Computing*. 22(2) pp 132-159.

Kaur, Simran Jit, Liaqat Ali, M. Kabir Hassan, and Md Al-Emran. (2021). "Adoption of digital banking channels in an emerging economy: Exploring the role of in-branch efforts". *Journal of Financial Services Marketing* 26 pp. 107–21

Keane, Jonathan (2021) "Big bank exits and fintech upstarts: Ireland's banking landscape is undergoing drastic change" *CNBC* Available at <https://www.cnn.com/2021/05/03/irelands-banking-landscape-is-undergoing-drastic-change.html> Accessed on 6th September 2021.

Laukkanen, T. (2007). "Customer preferred channel attributes in multi-channel electronic banking". *International Journal of Retail & Distribution Management*, 35(5), pp. 393–412.

Lee, Y., Kozar, K.A., & Larsen, K.R. (2003). "The Technology Acceptance Model: Past, Present, and Future". *Commun. Assoc. Inf. Syst.*, 12(50) pp. 752-780.

Legris, P., Ingham, J., & Colletette, P. (2003). "Why do people use information technology? A critical review of the technology acceptance model". *Information & Management*, 40, pp. 191–204.

Luarn P, Lin H (2005) "Toward an understanding of the behavioural intention to use mobile banking". *Computers in Human Behavior*. 21 pp 873-91.

Malatji, W.R., Eck, R.V and Zuva, Tranos (2020) "Understanding the usage, Modifications, Limitations and Criticisms of Technology Acceptance Model (TAM)", *Advances in Science, Technology and Engineering Systems Journal*, 5(6), pp. 113-117.

Martin, S. J., Bassi, S., and Dunbar-Rees, R. (2012). "Commitments, norms and custard creams - a social influence approach to reducing did not attends (DNAs)." *Journal of the Royal Society of Medicine* 105(3), pp. 101–104.

Maruping, L.M., Bala, H., Venkatesh, V. and Brown, S.A. (2017), "Going beyond intention: Integrating behavioral expectation into the unified theory of acceptance and use of technology". *Journal of the Association for Information Science and Technology*, 68 pp. 623-637.

Mirsch, T., Lehrer, C., & Jung, R. (2017). "Digital Nudging: Altering User Behavior in Digital Environments". In *Proceedings of the 13th International Conference on Wirtschaftsinformatik (WI) 2017* pp. 634-648.

Momsen, K., Stoerk, T (2014) "From Intention to Action: Can Nudges Help Consumers to Choose Renewable Energy?" *Energy Policy*, 74, pp 376–382

Moşteanu, Dr. Narcisa Roxana and Faccia, Dr. Alessio and Cavaliere, Luigi Pio Leonardo and Bhatia, Saurav, (2020) "Digital Technologies' Implementation within Financial and Banking System during Socio Distancing Restrictions – Back to the Future" *International Journal of Advanced Research in Engineering and Technology*, 11(6), pp. 307-315.

McAuley, D., (2014) "What is FinTech?" *Wharton-Fintech*. Available at: <https://medium.com/wharton-fintech/what-is-fintech-77d3d5a3e677>, Accessed on 12<sup>th</sup> August 2021.

Money Guide Ireland (2021) Charges on Current Bank Accounts in Ireland. Available at <https://www.moneyguideireland.com/comparison-of-bank-charges-in-ireland.html> Accessed on 24<sup>th</sup> August 2021.

Msweli, P. (2015) 'Factors contributing to bank selection choices: A generation theory perspective', 10, pp. 97-102.

Mun, Y. P., Khalid, H and Nadarajah, D., "Millennials' Perception on Mobile Payment Services in Malaysia", *Procedia Computer Science*, 124, pp.397-404.

Napitupulu, D. (2017). A Conceptual Model of E-Government Adoption in Indonesia. *International Journal on Advanced Science, Engineering and Information Technology*, 7(4), pp. 1471-1478.

Niederjohn, M. & Holder, Kim. (2019). "Econs vs. Humans: An Introduction to Behavioral Economics". *Social Education* 83(2), pp. 94–99.

Nobel Prize (2017) "Press release: The Prize in Economic Sciences 2017" Available at <https://www.nobelprize.org/prizes/economic-sciences/2017/press-release/> Accessed on 5<sup>th</sup> September 2021.

NPR Interview by Stacey Vanek Smith, Available at <https://www.npr.org/transcripts/1021438772> Accessed on 20th August 2021.

Park, S. Y. (2009). "An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning". *Educational Technology & Society*, 12 (3), pp 150 - 162.

Prelec, D., Loewenstein, G (1998). "The Red and the Black: Mental Accounting of Savings and Debt". *Marketing Science*, 17, pp. 4–28.

Sale, J., Lohfeld, L., and Brazil, K., (2002), "Revisiting the Quantitative-Qualitative Debate: Implications for Mixed-Methods Research", *Quality & Quantity: International Journal of Methodology*, 36, (1), pp. 43-53.

Saunders, M., P. Lewis and A. Thornhill (2015). *Research Methods for Business Students* Ebook. Harlow, United Kingdom, Pearson Education, Limited.

Scatolin, R. (2018). "Barriers to the adoption of online bank in Ireland". Available at [https://esource.dbs.ie/bitstream/handle/10788/3508/mba\\_scatolin\\_r\\_2018.pdf?isAllowed=y&sequence=1](https://esource.dbs.ie/bitstream/handle/10788/3508/mba_scatolin_r_2018.pdf?isAllowed=y&sequence=1). Accessed 6th September 2021.

Scherbaum, C. A. and K. M. Shockley (2015). "Analysing Quantitative Data for Business and Management Students". London, SAGE Publications Ltd.

Schmidt, J., Drews, P., and Schirmer, I. (2016). End-users' perspective on digitalization: A study on work order processing in the German banking industry. Conference: 22nd Americas Conference on Information Systems (AMCIS 2016) At: San Diego pp 1 -10.

Shaikh, S., Ismail, M., Mohd Shafiai, M. H., Ismail, A. G. and Shahimi, S., (2017). "Role of Islamic Banking in Financial Inclusion: Prospects and Performance". In book: *Islamic Banking Edition: CIBFR Studies in Islamic Finance* Publisher: Palgrave

Sikdar, P.; Kumar, A.; Makkad, M. (2015) "Online Banking Adoption: A Factor Validation and Satisfaction Causation Study in the Context of Indian Banking Customers". *International Journal of Bank Marketing*. 33(6) pp. 760 – 785.

Srinivas, V., Fromhart, S., Goradia U., (2015) "First impressions count. Improving the account opening process for Millenials and digital banking customers". Available at [https://www2.deloitte.com/ie/en/pages/financialservices/articles/first\\_impressions\\_count.html](https://www2.deloitte.com/ie/en/pages/financialservices/articles/first_impressions_count.html). Accessed on 16th August 2021.

Taylor, Charlie (2021) "Digital banks are 'good for the Irish banking sector' – survey" *Irish times*. Available at <https://www.irishtimes.com/business/financial-services/digital-banks-are-good-for-the-irish-banking-sector-survey-1.4525289> Accessed on 3rd September 2021.

Thaler, R.H (1999). "Mental Accounting Matters". *J. of Behavioral Decision Making*, 12, pp. 183–206.

Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: improving decisions about health, wealth, and happiness*. Rev. and expanded ed. New York: Penguin Books.

Thaler, R. H. (2015). "Misbehaving: the making of behavioural economics". New York : W.W. Norton & Company.

Torgler, B., "Moral Suasion: An Alternative Tax Policy Strategy? Evidence from a Controlled Field Experiment in Switzerland," *Economics of Governance*, 2004, 5 (3), pp. 235–253.

Torres, R., & Gerhart, N. (2017). Mobile proximity usage behaviors based on user characteristics. *Journal of Computer Information Systems*, 57 (1), 1-10.

Van Der Zande, Jochem. (2018). "Banks and digitalization: Accounts of Disruption from Sweden and Beyond". In book: *The Rise and Development of FinTech* pp.327-349.

Verhoef, Peter, Neslin, Scott and Vroomen, Björn. (2007). "Multichannel customer management: Understanding the research-shopper phenomenon". *International Journal of Research in Marketing*, 24(2), pp. 129-148.

Venkatesh, V., & Davis, F. D. (2000). "A theoretical extension of the technology acceptance model: Four longitudinal field studies". *Management Science*, 46, pp. 186–204.

Vives, Xavier. (2019). "Digital Disruption in Banking". *Annual Review of Financial Economics*. 11. pp. 243-272.

Weinmann, M., Schneider, C. & Brocke, J.v. Digital Nudging. *Bus Inf Syst Eng* 58, pp. 433–436

Wijland, R., Hansen, P., & Gardezi, F. (2016). "Mobile nudging: Youth engagement with banking apps. *Journal of Financial Services Marketing*", 21(1), pp. 51-63.

Zavolokina, L.; Dolata, M.; Schwabe, G. (2016) "The Fintech Phenomenon: Antecedents of Financial Innovation Perceived by the Popular Press". *Financial Innovation* 2 (16) pp 1 -16.

Zhang, T.; Lu, C.; Kizildag, M (2018). "Banking "On-the-Go": Examining Consumers' Adoption of Mobile Banking Services". *Int. J. Qual. Serv. Sci.* 10, pp. 279–295.

Zhou, T. (2012). "Understanding users' initial trust in mobile banking: An elaboration likelihood perspective". *Computers in Human Behavior*, 28(4), pp. 1518–1525.

## Appendix I Questionnaire

# Factors influencing banking choices in a Digitized world.

A bank account is a financial account maintained by a bank or other financial institution in which the financial transactions between the bank and a customer are recorded.

Payment Services enabling the movement of electronic payments

**\*Required**

For the purposes of this document, "Digital Banking" is intended to refer to Day to day Banking activities via a Current Account - payments, transfers, cash Standing Orders, Direct Debits across all online and digital platforms.



## 1. 1. Age \*

*Mark only one oval.*

- 18-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-65
- Above 66

## 2. 2. Gender

*Mark only one oval.*

- Male
- Female
- Non Binary
- Other

## 3. 3a. Which Financial Institution(s) do you use for

*Tick all that apply.*

	Bank Account Services	Payment Services
AIB	<input type="checkbox"/>	<input type="checkbox"/>
Bank of Ireland	<input type="checkbox"/>	<input type="checkbox"/>
Permanent TSB	<input type="checkbox"/>	<input type="checkbox"/>
Ulster Bank	<input type="checkbox"/>	<input type="checkbox"/>
An Post	<input type="checkbox"/>	<input type="checkbox"/>
EBS	<input type="checkbox"/>	<input type="checkbox"/>
KBC	<input type="checkbox"/>	<input type="checkbox"/>
Credit Union	<input type="checkbox"/>	<input type="checkbox"/>
N26	<input type="checkbox"/>	<input type="checkbox"/>
Revolut	<input type="checkbox"/>	<input type="checkbox"/>
PayPal	<input type="checkbox"/>	<input type="checkbox"/>
Google Pay	<input type="checkbox"/>	<input type="checkbox"/>
Apple Pay	<input type="checkbox"/>	<input type="checkbox"/>
None	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

## 4. 3b. If you selected other in 3a above please list institution below.

---

5. 4a. When did you last open a new Bank Account? \*

*Mark only one oval.*

- In the last Year
- Between 1 & 2 years
- Between 3 & 5 Years
- More then 5 Years

6. 4b. How did you open that Bank Account? \*

*Mark only one oval.*

- In person at a branch/ office
- Online/ Digitally

7. 5a. When did you last open a new Payment Services account? \*

*Mark only one oval.*

- In the last Year
- Between 1 & 2 years
- Between 3 & 5 Years
- More then 5 Years

8. 5b. How did you open your last Payment Service Account? \*

*Mark only one oval.*

- In person at a branch/ office
- On Line/ Digitally

Ease of Use



9. 6. I find Digital Banking easy to use? \*

Mark only one oval.

1      2      3      4      5

---

Strongly Agree                  Strongly Disagree

---

10. 7. I found it easy to open a Digital Bank Account? \*

Mark only one oval.

1      2      3      4      5

---

Strongly Agree                  Strongly Disagree

---

11. 8. I find it easy to access Banking and Payment services using Digital platforms?

\*

Mark only one oval.

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

12. 9. Digital Banking improves Banking Services? \*

Mark only one oval.

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

13. 10. Digital Banking reduces the cost of my Banking activity? \*

Mark only one oval.

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

14. 11. Using Digital Platforms for banking is a good idea?

Mark only one oval.

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

15. 12. I feel Digital Platforms are safe to use for my Banking activity? \*

Mark only one oval.

1      2      3      4      5

---

Strongly Agree                  Strongly Disagree

---

16. 13. I am positive toward using Digital Banking? \*

Mark only one oval.

1      2      3      4      5

---

Strongly Agree                  Strongly Disagree

---

What I use Digital Banking for



17. 14. I stay in touch with the latest service offering from my Digital Banking Provider?

*Mark only one oval.*

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

18. 15. I am a frequent user of Digital Banking?

*Mark only one oval.*

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

19. 16. I intend to move more of my Banking activities to digital Platforms? \*

*Mark only one oval.*

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

20. 17. I feel confident finding the support I require when using Digital Banking? \*

*Mark only one oval.*

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

21. 18. I have the necessary skills for using Digital Banking? \*

Mark only one oval.

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

22. 19. I would recommend using Digital Banking to a friend? \*

Mark only one oval.

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

23. 20. I like using Digital Banking as its used by Friends and family? \*

Mark only one oval.

	1	2	3	4	5	
Strongly agree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly Disagree

What's important to me



24. 21. Select from the options below the reason I chose my bank account provider?

\*

*Mark only one oval.*

- A friend recommended
- I got an email invitation from a friend
- I researched myself
- An advertisement got me interested
- Sponsorship of an event or team
- I relate to the Brand
- Direct Marketing
- Other

25. 22. Creating a single view of all my accounts in one place is important to me?

Mark only one oval.

	1	2	3	4	5	
Very Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not important

26. 23. Saving Targets, Spending targets or Account analytics functionality offered by my digital banking provider has influenced my behavior?

Mark only one oval.

	1	2	3	4	5	
Yes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No

27. 24. The below is important to me selecting a banking or payment service provider a important to me. (Answer for areas you consider)

Mark only one oval per row.

	Strongly Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Strongly Disagree
To make payments instantly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simply send funds to friends and family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security of the funds being transferred	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security of digital banking application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to split bill payments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other payment functionality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This content is neither created nor endorsed by Google.

Google Forms