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Understanding Trust in Online Banking: An Empirical analysis in Portugal

Maria do Carmo Eva Miguéis Fernandes

Master in Management

Supervisor:
PhD Luís Miguel da Silva Laureano, Assistant Professor,
Iscte - University Institute of Lisbon

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BUSINESS
SCHOOL

Department of Marketing, Operations and Management

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Acknowledgments

Some people might look at the thesis as a journey. And what a journey it was. With ups and downs, as it should be. Hence, I must thank those who stood by my side throughout every up and every down and with whom I will cross the finish line.

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Lastly, I would like to thank my Supervisor, Professor Luis Laureano, for closely helping me to close this chapter on my academic career.

About to end this journey, I am looking forward to the next one. Thank you.

Resumo

A utilização da Internet aumentou significativamente nos últimos anos e é hoje considerada o melhor canal de distribuição de produtos e serviços para vários tipos de negócios. O *Internet banking*, ou *Online banking*, tornou-se a tecnologia de informação mais utilizada pela maioria dos clientes em todo o mundo. Este artigo estende uma área de pesquisa de sistemas de informação relacionada com os serviços financeiros, explorando o fator confiança nos canais online. À medida que mais instituições financeiras procuram formas de aumentar as taxas de adoção dos serviços online, a confiança torna-se um fator importante a ser explorado. A razão está nas preocupações dos clientes relativamente ao processamento das informações financeiras. Assim, este trabalho tem como objetivo investigar o nível de confiança dos consumidores portugueses na utilização do *Online banking* e os fatores que influenciam a confiança dos clientes na utilização dos websites bancários. Foram abordados conceitos como segurança percebida, privacidade percebida, qualidade e usabilidade, experiência com computadores e o mundo online, acessibilidade e literacia financeira. Para aprofundar o entendimento, foi desenvolvida uma metodologia quantitativa com o lançamento de um questionário online e obteve-se um total de 355 respostas. Os resultados revelam que a segurança percebida, a privacidade percebida e a acessibilidade são os fatores que têm impacto na confiança. A confiança foi considerada um fator importante na promoção de uma atitude em relação à adoção do *Online banking*. Adicionalmente, este estudo sugere que os portugueses ainda têm um certo nível de receptividade e preocupação quando utilizam os serviços bancários online.

Palavras-chave: Serviços bancários online; Confiança; Adoção; Mercado Português.

Sistema de Classificação JEL: G21 (Banks), G53 (Household Finance: Financial Literacy).

Abstract

The use of the Internet has increased significantly over recent years and is now considered as the best channel for the distribution of products and services of several types of businesses. Internet banking, or online banking, has become the most significant information technology used by most customers worldwide. This paper expands an area of information systems research related to financial services by exploring the element of trust in Online Banking. As more financial institutions are currently seeking ways to boost Online banking adoption rates, Trust is an important factor to be explored as a crucial determinant in the relationship. The reason behind is customers' concerns engaged in processing financial information. Thus, this work aims to investigate the level of trust by the Portuguese consumers when using online banking services and the factors that influence customers' trust in using banks' websites. Concepts such as perceived security, perceived privacy, quality and usability, computer and online experience, accessibility and financial literacy were approached. To gain a deep understanding, a quantitative methodology was developed by the means of an online questionnaire and a total of 355 responses were obtained. Findings reveal that Perceived Security, Perceived Privacy and Accessibility are the most important predictors of Trust. Trust was found to be an important factor in fostering a positive attitude toward adopting banks 'websites. Additionally, this study suggests that Portuguese still have a certain level of receptiveness and concerns regarding trust when using online banking services.

Keywords: Online Banking; Trust; Adoption; Portuguese market.

JEL Classification System: G21 (Banks), G53 (Household Finance: Financial Literacy).

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Glossary

ACCES - Accessibility

BES - Banco Espírito Santo

BPI - Banco Português de Investimentos

CGD - Caixa Geral de Depósitos

CIBM - Consumer Internet Banking Model

COMPEXP - Computer experience

DOI - Diffusion Of Innovation

FL - Financial Literacy

GTPM - General Trust Perception Model

ONLEXP - Online experience

PBs - Perceived Benefits

PEOU - Perceived Ease Of Use

PI - Perceived Impediment

PPRIV - Perceived Privacy

PSEC - Perceived Security

PU - Perceived Usefulness

QUAL - Quality

SFCU - Stanford Federal Credit Union

SI - Social Influence

TAM - Technology Acceptance Model

TRA - Theory of Reasoned Action

USAB - Usability

1. Introduction

In this first chapter are presented the theme and key theoretical concepts that will be investigated throughout the study, followed by the description of the problem and the primary research questions fundamental to the topic. Before moving on to the next chapters the thesis structure will be described.

1.1 Context and Research problem

We are in the fourth industrial revolution, and our economy and the way companies deal with their customers have been redesigned by technology. Almost every industry was touched by a wave of digitalization, and the banking sector, in particular, is experiencing an accelerated process of digital transformation. With consumers' changing preferences for more digital services and the entry of new "players" into the market, banks must find their way to adapt and integrate technology or they become obsolete, which will ultimately lead to their demise, forcing institutions to "sink or swim" (Francisco, 2020).

For half a millennium, retail banks have worked on the basis of physical distribution. In the last half century, that model has been challenged to move towards electronic distribution. At the end of the first decade of the new millennium, banks have finally reached the point where electronic distribution has matured, works, and is proven (Skinner, 2014). Then came the concept of digital banking, which entails the digitalization of traditional banking services in order to deliver financial services to customers (Mothibi & Rahulani, 2021). A series of new channels surge with the digitalization of financial services, namely online banking, which provides digital banking products and services through the banks' websites anytime and anywhere, transforming the way customers are served.

Online banking is one of the most recent and innovative services as well as a modern trend, that offers an efficient delivery channel for the products and services of conventional banks. Also referred as Internet banking, is described in the literature as "…to the use of the Internet as a remote delivery channel for banking services." (Furst et al., 2002, p. 97). These services include creating a bank account, transferring money among different accounts, electronic bill payment, and many more, allowing the customers of the bank to receive and pay bills on the website of the bank.

Internet banking, or Online banking, has become the most significant information technology used by most customers worldwide, with the promise of greatly improving operational efficiency and enhancing financial performance (Tunay et al., 2015). This channel

lets the customer handle many banking transactions via personal computer or other electronic devices. It is a system that in the long run makes a bank save money by not paying for tellers or for managing branches. Plus, it is cheaper to make transactions over the internet. The internet also allows banks to reach a whole new market and increase their customer base because there are no geographic boundaries with the internet. Banks turn out to became more efficient by providing a full range of services available to customers online, saving the need for them to go to a branch (Muluka, 2015). Thus, banks prefer their customers to be more oriented towards the use of digital banking or automation of services in order to use the staff more efficiently through their branches, instead of performing routine operations (Veseli-Kurtishi et al., 2020).

Data collected by Eurostat (2022) show that today, 53 percent of the Portuguese population (ages between 16 and 74 years) uses the internet to access online banking sites. Although it is a percentage that is increasing significantly over the years, the numbers are still low in comparison with other European countries.

Some researchers have shown that lack of trust can be the most significant long-term barrier affecting the adoption of online banking. According to Akhlap and Ahmed (2013), the issue of trust and other related factors such as privacy and security concerns have been reported to affect customers' level of acceptance to adopt or use online banking without having their uncertainty reduced. Goudarzi et al. (2015) consider other factors that could affect the level of trust and divide them into two groups: factors related to the banks' websites characteristics (such as security, privacy, quality, usability, and accessibility) and factors related to the user characteristics (user knowledge and disposition to trust).

According to Alsajjan and Dennis (2010), trust is a crucial factor for boosting the level of online banking adoption, and since it would be beneficial for banks to increase the customers adoption of their online services in pursuing their necessities, it will be useful to study customers' perspective of trust when dealing with online banking and understand the factors that could influence their level of trust when using this channel.

1.2 Theoretical Contribution, Objectives and Research Questions

This thesis focuses on the level of trust and concerns when pursuing activities through online banking from the Portuguese banks' customers. More precisely, understanding the factors that could affect customers' trust, from factors related with the characteristics of the website itself to factors related to the characteristics of the user. This way, the goal is to gain a deeper understanding of the factors that could influence the level of customers' trust in pursuing their necessities through online banking.

As trust has such an important role in boosting the level of online banking adoption, as any other online environment or application, and is beneficial for financial institutions to had customers more evolve in using banks' website to pursue their activities, the findings of this work will contribute towards a clearer and more structured understanding of the level of trust in online banking service from the Portuguese customers and the factors that determine their trust in using the channel.

This study contributes to the gap in academic literature addressing missing studies of customers' trust and concerns in online banking services in the Portuguese market, where the adoption of this channel, although being increasing, it is not achieving the expected numbers compared with other European countries. It also aims to deliver information to retailers as a guide, considering the data obtained, so that banks have tools to improve the online services experience. Once the review of literature is completed and structured, this thesis aims to answer the main research question:

Which factors determine consumers' trust in online banking?

Based on the analysis of the work done in the literature review, the key variables that may affect customers' trust in online banking were identified. These variables are divided into two groups, the group of variables related to the website' characteristics and the group of variables related to the consumers' characteristics:

- Websites' characteristics: perceived security, perceived privacy, usability, quality;
- Consumers' characteristics: customers' knowledge (namely, computer and online experience, and financial literacy) and accessibility.

1.3 Research Structure

This thesis consists of six chapters. The first chapter provides some context on the theme and industry information, introduces the research gap, and expresses the main research question to be explored. Chapter 2 provides a theoretical framework that contains several theoretical concepts and how they are relevant for the present study, such as the definition of Online banking, the determinants of Online banking adoption, how trust is a crucial factor for embracing any online environment and the factors influencing the level of trust in the adoption of Online banking services. Chapter 3 explains the research methodology by defining the research design, sampling, and data analysis methods used for the study. Chapter 4 presents findings from data analysis and results from the statistical tests performed and Chapter 5 responds to the research questions and validates the hypotheses given the outcomes of the

statistical tests. Lastly, Chapter 6 introduces conclusions, outlines the implications and limitations of the research, and provides suggestions for future research.

2. Literature Review

This chapter presents the literature review and is divided into four parts. The first provides an overview and definition of online banking, the second analyzes online banking adoption, the third focuses on trust as an important factor for online banking adoption, and finally, a review of the problem to evaluate in this research is presented.

2.1 Online Banking

Since the mid-1990s, there has been a fundamental shift in banking delivery channels toward using self-service channels such as online banking services. Internet banking, or online banking, is referred to as an "Internet portal, through which customers can use different kinds of banking services ranging from bill payment to making investments" (Pikkarainen et al., 2004, p. 224).

According to Furst et al. (2002), internet banking involves the use of the Internet as a remote delivery channel for banking services. A bank can offer internet banking in two main ways, either a bank that already exists physically establishes a website and offer online services to its customers in addition to its traditional delivery channels or a bank can develop a virtual, branchless, or Internet-only bank, also called the Neobanks.

In recent years there has been a surge of Neobanks (Stuart, 2019) – independent digital-only entities – focused on offering newer technology at a lower cost. According to a Fincog (2020) article on "The Next Generation of Banks", in 2020 there were over 350 million customers spread through 250 Neobanks. A well-known example of an online only financial institution is Revolut.

Through the banks' website, customers can perform a series of activities such as viewing account balances and transactions histories, paying bills, transferring funds between accounts, ordering cheques, managing investments, and stock trading (Pikkarainen et al., 2004; Alsajjan & Dennis, 2010). Except for cash withdrawals, it enables customers to perform or access any banking transaction at the click of a mouse.

The very first online banking service was launched by Stanford Federal Credit Union (SFCU) in 1994. Since then, online banking has spread rapidly due to its convenience and ease in conducting transactions quickly and at a specific service level (Yoon, 2010). In Portugal, the first banking service based on the Internet was provided in 1998 by Banco Espírito Santo (BES). Followed by Banco Português de Investimentos (BPI) and Caixa Geral de Depósitos

(CGD), that start providing services through online means in 2000 and 2003, respectively (Cândido, 2010).

Currently, as explained by Flavián et al. (2004), the implementation of the Internet as an alternative channel for the distribution of financial services is a must, a competitive necessity, instead of just a way to achieve a competitive advantage with the advent of globalization and fierce competition.

Online banking is one of the most recent and innovative services as well as a modern trend, offering conventional banks' products and services through an efficient delivery channel. The rise of online banking is also due to the benefits for both sides, the provider, and the customer as well. The internet allows banks to reduce their operations costs by limiting the number of physical stores and staff that they use and also to increase the banks' market share (Kitsios et al., 2021), because there are no geographic limits for the Internet. Additionally, Acharya et al. (2008), concluded that banks with a wider range of online banking services are more proficient than those with a limited web presence.

For customers, the main benefits are cost and time savings, since internet banking allows users to control bank accounts at any time and place (Howcroft et al., 2002). Moreover, the access to personalized information for making investment decisions and the comparison between alternate services.

2.2 Online banking adoption

Several studies indicate that online bankers are the most profitable and wealthiest segment to banks. On this basis, no bank today can underestimate the power of the online channel (Pikkarainen et al., 2004). Banks prefer their customers to be more oriented towards the use of digital banking or automation of services, such as online banking, in order to use the staff more efficiently through their branches, instead of performing routine operations (Veseli-Kurtishi et al., 2020).

Online banking and e-banking has experienced phenomenal growth in recent years (Fox & Beier, 2006), although the growth rate in e-banking has not kept pace with that of general Internet usage. According to a recent Eurostat (2022) report, today around 58% of adult Europeans use internet banking. Figure 2.1 below shows that this share has been constantly increasing over the years.

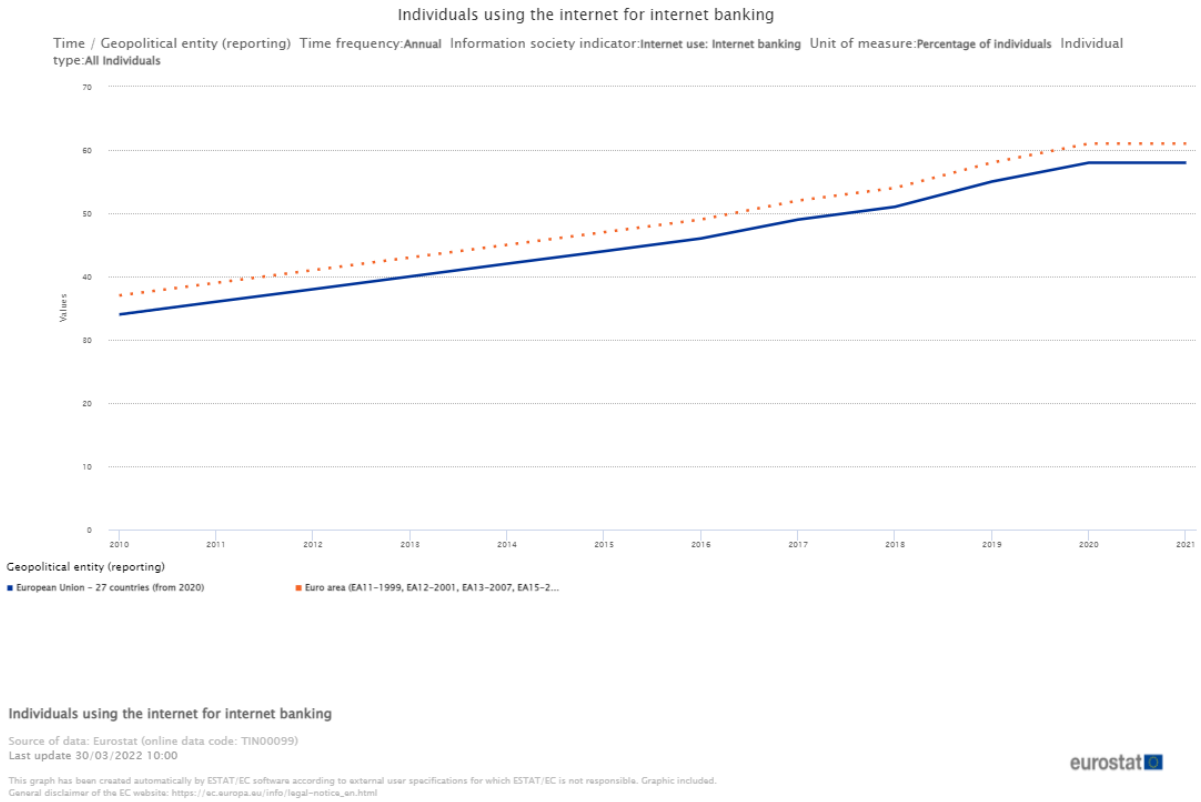

Figure 2.1 – Individuals using the internet for internet banking
Source: Eurostat

Online Banking is becoming one the most popular payment methods in Europe, allowing customers of a bank or other financial institution to develop a wide range of financial transactions through their websites. It is obvious that Europeans confidence over time has increased, and the use of physical cash is now to be left behind.

The same report mentioned above from Eurostat (2022) found that, in 2021, 96 percent of the Norwegian population use online banking sites, making Norway the country with the strongest internet banking penetration in Europe, followed by Denmark and Iceland (Eurostat, 2022). In the case of Portugal, the Portuguese population is on the bottom half of the European countries that do not access online banking websites so much, with 53% of the population adopting online banking services (see Figure 2.2).

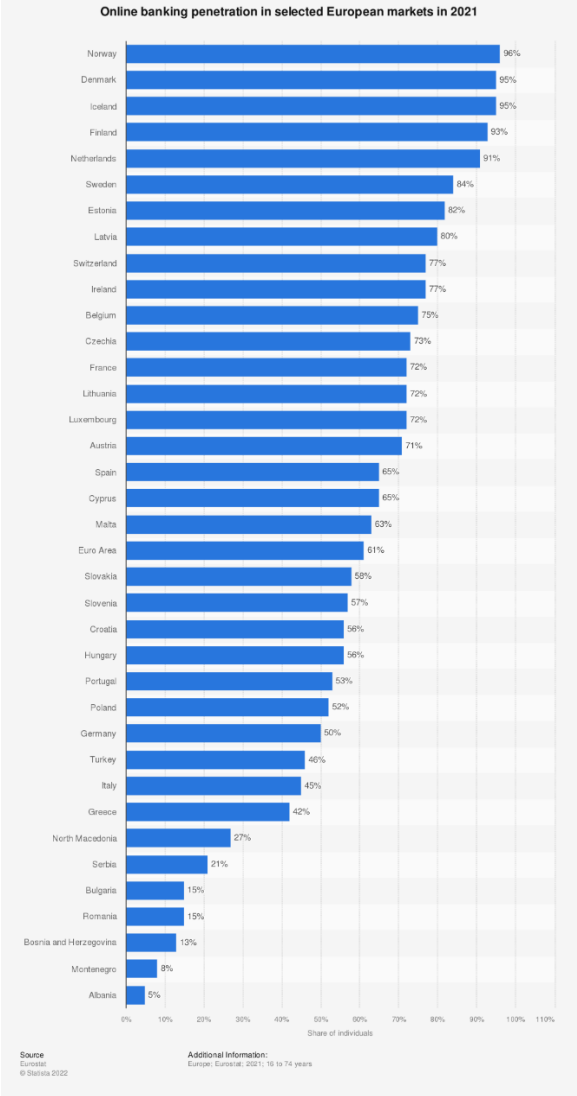

Figure 2.2 – Online banking penetration in selected European markets in 2021
Source: Statista

Although the Portuguese adoption of online banking is small comparing to other European countries, the Portuguese association of Banks found that in 2020, the number of users of online banking services in Portugal increased by 6.9%, leading to a digitalization acceleration. Also, due to the Covid-19 outbreak, the digitalization of Portuguese Banks reached unforeseen numbers, where the five largest Portuguese banks have more than 4 million digital customers (Jornal de Negócios, 2020; Jornal Económico, 2020). All banks recorded greater customer interaction through digital means.

2.2.1 Factors influencing Online Banking Adoption

As referred by Sikdar et al. (2015), human behavior, in general, takes time to adjust and accept radical changes within its macro environment. Banking customers accustomed to pursuing their necessities through branches exhibit diverse apprehension towards the adoption of online

banking. This makes imperative for banks to identify and understand the decisive factors for their customers to embrace online banking services.

The studies exploring the factors that influence customers' attitude to embrace innovative retail services, such as online banking, have widely focused on user technology acceptance (Wang et al., 2003; Pikkarainen et al., 2004; Alsajjan & Dennis, 2010). Through the years, technology acceptance has received wide and intense interest, with several theoretical approaches used and many developed models to investigate the determinants of acceptance and adoption of new information technology.

a. Technology Acceptance Model (TAM)

Individuals' decision to adopt a new information system is primarily based on his/her attitude towards the system which is a function of Perceived Ease Of Use (PEOU) and Perceived Usefulness (PU), according to the Technology Acceptance Model (TAM) of Davis (1989) and perhaps the most widely applied. This model is an adaptation of the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein (1980).

Davis (1989, p. 320) stated that ease of use is "the degree to which a person believes that using a particular system would be free of effort" and usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance". Usefulness is influenced by ease of use and both predict attitude toward using, that are related to intention and finally behavior.

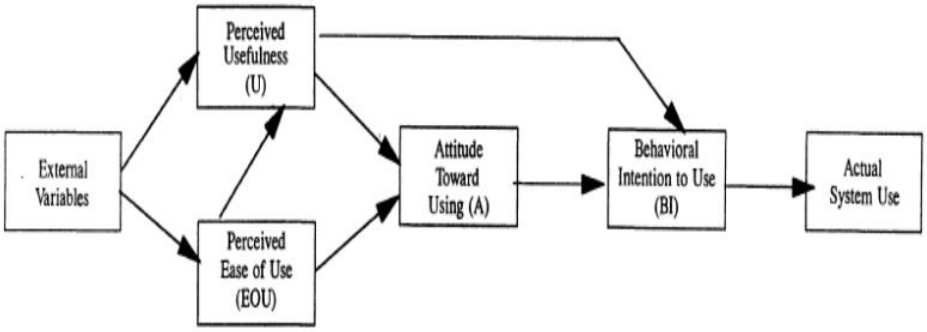

Figure 2.3 – The Technology Acceptance Model
Source: Davis. (1989)

The TAM is a popular proven theory in the literature and has been the base of several new models (Jackson et al., 1997; Venkatesh & Davis, 2000). In the case of the new model, developed by Venkatesh and Davis (2000), the theory also considers Subjective Norm,

Voluntariness, Image, Experience, Job Relevance, Output Quality, and Result Demonstrability as determinants to customers' intention to use a new technology.

In sum, TAM validity has been demonstrated across a wide range of IT studies but, more recently, the model served as a foundation to build a theoretical framework specifically applied to Internet banking use. Ezzi (2014) and Safeena et al. (2014), proposed two different models to introduce the factors behind the intention to use online banking services.

b. Internet Banking Acceptance Models

As explained by Ezzi (2014), the two main factors (PU and PEOU) which are considered to be fundamental to determining the acceptance (attitude toward) and adoption (intent to use) of types of information systems may not fully explain the consumers' behavior to adopt Internet banking. The services provided by banks through the internet have their specific characteristics, different from other information systems, so the determinants of potential system adoption are likely to vary more. Therefore, Ezzi (2014) presented a new model known as the Consumer Internet Banking Model (CIBM), represented in Figure 2.4, based on the original TAM model, but adapted to represent the additional determinants considered to influence attitudes toward and adoption of internet banking services.

The Consumer Internet Banking Model (CIBM) considers, additionally to the factors of PU and PEOU, the new following constructs: Perceived Privacy and Security – individuals fear providing sensitive information such as financial details on the internet; Trust – customers' confidence in quality and reliability of the services offered; Computer Self-efficacy – ability to successfully execute the task; Responsiveness – related to the speed and effectiveness of the bank's website to provide information; Demographic Factors, such as age, education, gender, and income. The model suggests that Computer Self-efficacy has a direct influence on PEOU factor, and Responsiveness is related to PU as customers who find the workings of Internet banking services to be responsive to processing their needs quickly and resolving their issues timely and efficiently are likely to see value in online banking systems.

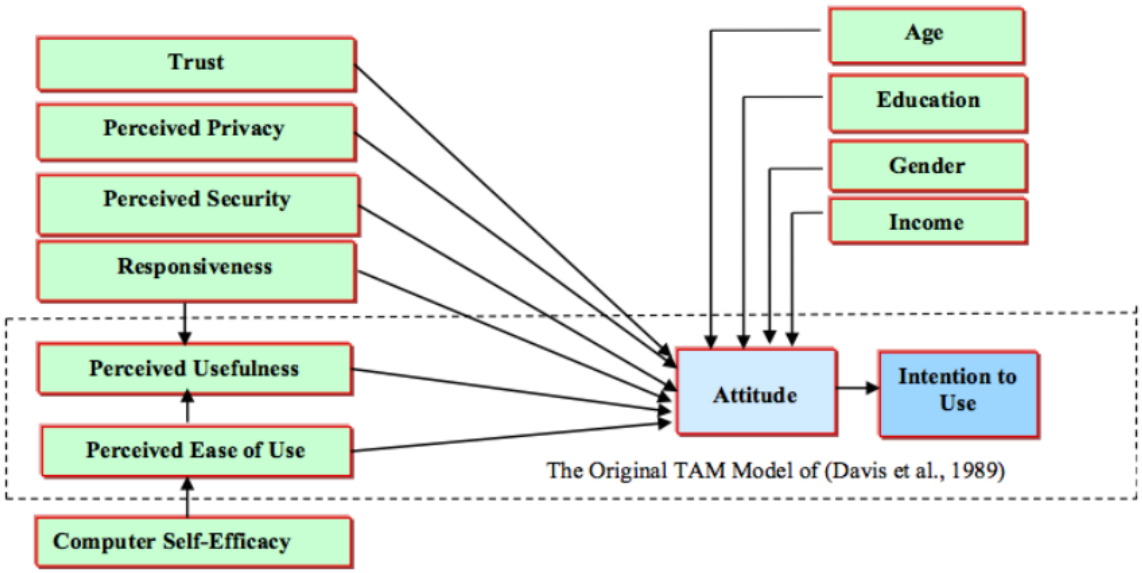

Figure 2.4 – Consumer Internet Banking Model (CIBM) Framework
Source: Ezzi (2014)

Another model related to internet banking adoption was proposed by Safeena et al. (2014). The theory of Safeena et al. (2014) proposes that Perceived Benefits (PBs), Perceived Impediment (PI) and Social Influence (SI) are the important factors influencing internet banking adoption.

Safeena et al. (2014) considered PU and PEOU, the main components in the TAM model, as the components of PBs. Additionally, the study also considers Relative Advantage, one of the five attributes of innovation in Rogers (1983) theory on Diffusion Of Innovation (DOI), as the third component of PBs. Relative advantage is the degree to which a new product is more advantageous to the customers than the competing brands.

Earlier literature shows that Trust and Security are the two components of risk, which have emerged as the top issues inhibiting internet banking adoption. Plus, regulatory and legal issues, the lack of sufficient awareness regarding laws concerning Internet banking activities, have been preventing consumers from using services through online banking. Therefore, Safeena et al. (2014) considered Trust, Security and Legal Issues as the components of PI, which have a negative relation with Internet banking adoption.

According to the Theory of Reasoned Action by Ajzen and Fishbein (1980), Social Influence is one of the factors that determines a person's intention to perform the behavior. Safeena et al. (2014), described Subjective Norm and Image as the component of SI. Subjective Norm is the perceived social pressure to engage or not to engage in a behavior. The Image was measured as one of the factors which determine user's intention to adopt new technology in the model of Venkatesh and Davis (2000), defined by Moore and Benbasat (1991, p. 137) as

"the degree to which use of an innovation is perceived to enhance one's image or status in one's social system".

Figure 2.5 represents the study model of Saffena et al. (2014), which states the positive effect of Perceived Benefits (composed by Perceived Usefulness, Perceived Ease Of Use and Relative Advantage) and Social Influence (described by Subjective Norm and Image) in building Internet banking adoption, and negative effect of Perceived Impediments (defined by Trust, Security and Legal Issues) toward Internet banking. Also, having into account Demographic Factors, such as age and gender, that have a moderating effect on Internet banking adoption.

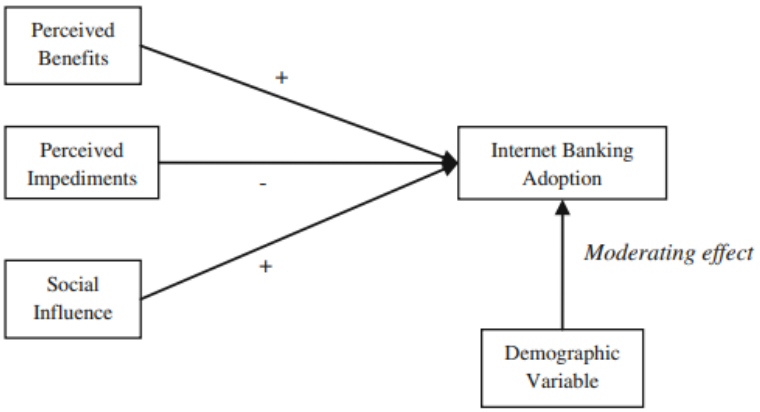

Figure 2.5 – Internet banking adoption – a research framework
Source: Safeena et al. (2014)

2.3 Trust in Online Banking

Curral and Judge (1995) defined trust as an individual's reliance on another party under conditions of dependence and risk. Online trust is one of the key obstacles to vendors succeeding on the Internet medium, a lack of trust is likely to discourage online consumers from participating in e-commerce. Chen and Barnes (2007) concluded that trust substantially plays an important role in online purchasing intent, as well as Alsajjan and Dennis (2010) that documented trust as one of the most critical factors affecting the success of any online environment.

The models of internet banking adoption proposed by Ezzi (2014) and Safeena et al. (2014) consider trust as a determinant factor towards an attitude to use banks' websites. As referred by Alsajjan and Dennis (2010), trust plays an important role in boosting the level of adoption of internet banking among online customers.

According to Suh and Han (2002) trust has an influence in determining consumers' initial and continued use of online banking. There are already questions of trust around the overall

commerce with suppliers because they are inevitably independent, not fully predictable and there is a certain level of uncertainty. But with the internet banking environment, the subject of trust may be even more important. This is because the cultivation of trust is particularly important where uncertainty and risk are inherent and internet banking is described as inherently risky from the viewpoint of security, since the online world permits remote users in all corners of the world to access critical files on computers and information transferred via the Internet.

Internet banking takes place in a more unpredictable environment, it lacks a human interface in online transactions, representing additional consumer risk owing to the absence or complexity of contracts, thus trust is more necessary in online exchanges than in traditional exchanges (Maimunatu Ya'u & Mu'azu, 2021). Hence, since customer trust is such a major determinant influencing the adoption and continue use of internet banking it is important to understand the factors behind the concept of trust in this context.

2.3.1 Factors of trust in Online banking adoption

As stated in the previous section, researchers have considered trust as one of the key constructs for acceptance and continue usage of online banking services. Therefore, understanding the determinants that influence the user trust in using banks' websites started to be investigated in more detail.

Costante et al. (2011) developed an online user's perception of trust in order to establish services that better meet users' requirements for trust, a crucial factor to e-services adoption. The General Trust Perception Model (GTPM) of Costante et al. (2011) identified two different groups of factors influencing trust in an online service: one group is related to the characteristics of the website and another one is related to the characteristics of the customer. Goudarzi et al. (2015) used the GTPM as a base to introduce a model of customer trust for Internet banking adoption specifically.

The research model presented by Goudarzi et al. (2015), represented in Figure 2.6, assumed some factors related to the website characteristics, for example Security, Privacy, Usability, and Quality; and factors related to properties of the user, such as Users' Knowledge and Disposition to Trust. Plus, the factor of Accessibility, meaning proper and direct access to a computer and to the internet, two indispensable factors regarding internet banking adoption. Accessibility is a construct more related to user properties since it also describes basic knowledge of computer and internet usage. Each item observed were proved to have significant effects upon trust.

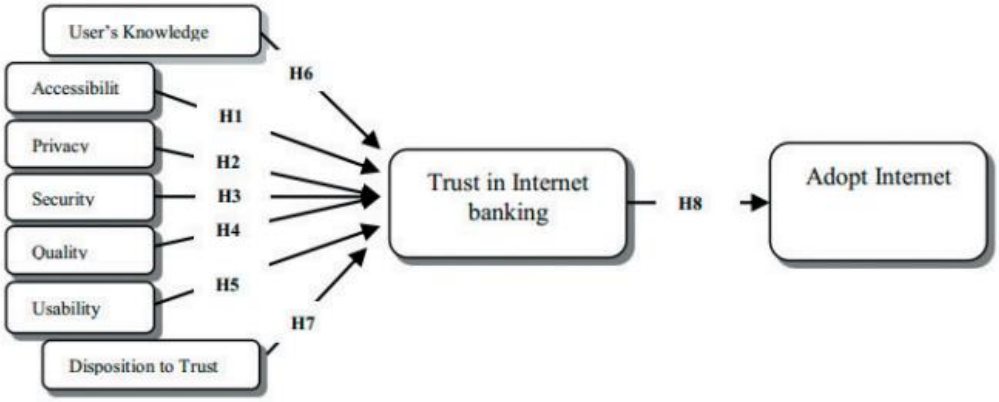

Figure 2.6 – Model of Customer Trust for Internet Banking adoption
Source: Goudarzi et al. (2015)

Goudarzi et al. (2015) included customers' disposition in the proposed model to study trust towards the adoption of internet banking. According to Gourdazi et al. (2015), users' disposition to trust is essential to display trust between humans. Since consumers have different developing experiments, character types, and social qualification, their disposition to trust is also different.

All the constructs considered by Goudarzi et al. (2015), from the factors related to the website characteristics to the factors related to proprieties of the user itself were considered to have significant effects upon trust.

Based on a serious of previous studies about the factors that could have an influence on the level of customers trust in online banking, the following are the ones more suggested and explored by the literature and selected to be evaluated in this research.

i) Website-related factors

- **Security**

The first factor that assists trust development in online users is the assurance of safety and security. The importance of security in relation to trust is identified by several researchers (Bargh et al., 2002; Yousafzai et al., 2003; Gourdazi et al., 2015). In particular, it is the perception of security, rather than the security mechanisms themselves, that affect the level of trust in users of online services (Patton & Gregory, 2004). Perception of security is described as a subjective belief of a user that their communication with the systems is protected from all potential threats (Ally & Toleman, 2005). The security mechanisms act as antecedents of this belief.

According to Liao and Cheung (2002), perceived security was rated to be of high importance by users of online banking systems. From a user's perspective, the visibility of these security mechanisms through the user interface is an important aspect and hence the integration of these security mechanisms with the interface is important.

Some of the visible security mechanisms are padlock symbol in browser (indicates encrypted connection), warning messages when moving to unsecured network connections, presence of https, login IDs pages and Passwords, Privacy policy disclosures (Turner & Zavod, 2001). Also, the interaction between customers and security mechanisms will also vary according to the pre-existing knowledge about these mechanisms. Users with advance knowledge of the concepts of security will be more aware of the secure strategies of the websites.

- **Privacy**

Privacy defines the ability of the internet banking system to ensure the secrecy of personal and customers account information. Sheng et al. (2008) highlighted that privacy affect customer's behavior in doing transactions over the internet. Customers who adopt electronic financial services are more likely to perceive problems related to loss of privacy, as the internet seemingly allows other people to access their information easily (Jones et al., 2000). Customers do not always believe privacy policies will keep customer information confident (Gerrard & Cunningham, 2003).

As stated by Featherman and Pavlou (2003), privacy includes user's concerns about losing control over the provided and required personal information when the customer is using Internet banking in conducting transactions. These concerns include personal information collection, storage, usage, and disclose, location tracking and unsolicited advertising. To increase trust in Internet banking protection of personal information is a major factor.

As for security, is more about the perception of privacy, as used in the Yousafzai et al. (2003, p. 853) proposed model of e-trust for electronic banking, is the "customer's perception regarding their ability to monitor and control the information about themselves".

- **Usability and Quality**

Usability is described by Diniz et al. (2005) as the activities of the user that has interaction with the website, for navigating, browsing, and performance of tasks easily until completion of the transaction. Customers like a website that is easy and simple for navigating to achieve their research, to acquire complete information exactly, and to enhance their decision-making

process. Usability is one of the determinants introduced by Gourdazi et al. (2015) as influencing the level of trust for adoption of Online banking services.

Besides usability, Gourdarzi et al. (2015) proved that the good quality of the website improves the growth of consumer trust in online environments. A well-designed website of an online seller should offer consumers adequate information for making decisions in purchasing, allow them to navigate in a use-friendly environment and interact with the modern vendor, and make buying procedures easy to follow.

ii) Customer related factors

- **Accessibility**

According to Goudarzi et al. (2015), a proper and direct access to a computer and the internet, as well as basic knowledge, are requirements to access the internet banking services. From a study conducted by Lichtenstein and Williamson (2015), the users with higher levels of internet banking adoption were also the ones with high level of internet accessibility. The level of accessibility can influence in the choosing of their banking channel and provide to the customer the possibility of using internet banking with dedicated and unchallenged access. Goudarzi et al. (2015) proved that accessibility positively influences trust towards the use of internet banking.

- **Users' knowledge**

As referred by Costante et al. (2011) the higher the knowledge, the higher the trust. Sam et al. (2005) indicated computer confidence as a factor that has a crucial role in the adoption of electronic banking services in general. An individual used to perform activities through electronic devices will probably be more comfortable using online banking services, since it must be done through a computer or any other electronic device with access to the internet. Gourdarzi et al. (2015) also refer that basic knowledge of how to use a computer is a requirement to access banks' websites.

Customers' level of internet experience and their degree of trust in an electronic commerce environment are positively related together. Researchers have found that customers' level of internet experience has an effect on their tendency to trust the technology, which may in turn lead to the enhancement of their trust in electronic commerce (Bart et al., 2005).

Lastly, the development of remote banking services, such as internet banking or mobile banking, attributes a degree of independence to the consumer that permits the use of financial

services without any help of a bank employee, which requires a certain level of financial literacy (Korobov, 2020). A higher degree of financial literacy coincides with higher trust in banks (Biklsma et al., 2022), and it proved to be a determinant influencing customers to adopt online banking (Andreou & Anyfantaki, 2019).

2.4 Problem

The use of Internet has increase dramatically over recent years and is now regarded as the best channel for distribution of products and services of various types of businesses, such as internet banking services (Goudarzi et al., 2015).

As referred in the previous section, online banking services have several benefits for both banks and customers. However, despite all the advantages of the service for customers, the adoption rates of online banking services are not registering the expected numbers (Rodrigues, 2017). Although the adoption rate in Portugal has been increasing in recent years, the Portuguese population is still among the half of the European countries that do not access online banking websites so much, with only 53% of the adult population adopting Online banking services (Eurostat, 2022).

Besides the various benefits for customers, there are also numerous of advantages from the provider side. Kitsios et al. (2021) stated that internet allows banks to reduce their operations costs by limiting the number of physical stores and staff they use, and also increasing the banks' market share. Hence, and as Veseli-Kurtishi et al. (2020) concluded, banks prefer their customers to be more oriented towards use of digital banking or automation of services in order to use the staff more efficiently through their branches, instead of performing routine operations.

As more financial institutions are currently seeking ways to boost Internet banking adoption rates, trust is an important factor to be examined as it was considered as a significant component in the relationship (Goudarzi et al., 2015). According to Gabner-Krauter and Faullant (2008), trust is a focal point in any type of transaction, being especially relevant in online transactions mostly because the lack of trust is one of the main reasons for the reluctance of customers to conduct financial transactions online (Flavian et al., 2006).

Being trust such a key factor to influence the adoption and continue use of online banking, it is important to understand the constructs behind customers' trust. In this research it was considered two groups of factors, one related to the banks' website characteristics and another related to customers' characteristics. Besides, the research focus on how Portuguese users feel

about pursuing their banking activities through online means, trying to understand what the level of customers' trust is in using online banking services in Portugal.

3. Research Methodology

The Methodology section, as described by Kallet (2004), is to precisely and clearly describe the research design and the actions undertaken to collect and analyse data for other to judge the merit of the study and its conclusions, while also laying out a blueprint for the study to be replicated in the future.

3.1 Research approach and objectives

The goal of this thesis is therefore to understand the level of customers' trust when using online banking services and the factors that influence customers trust in using banks' websites. More precisely, the key research question of this study is "Which factors determine customers' trust in online banking?". Several studies indicate that concerns around websites' security and privacy arise when using online banking, which are two important factors that influence the level of customer trust. Additionally, there are website nonrelated factors that also influence customer trust in online banking, such as confidence in using electronic devices and how comfortable are they with the online world.

It is proven that trust is an important factor that influences the level of adoption of online banking. From the models developed until today and that were analysed in the literature review, the following research model was established for this study (Figure 3.1). The model was adapted from the research of Gourdazi et al. (2015).

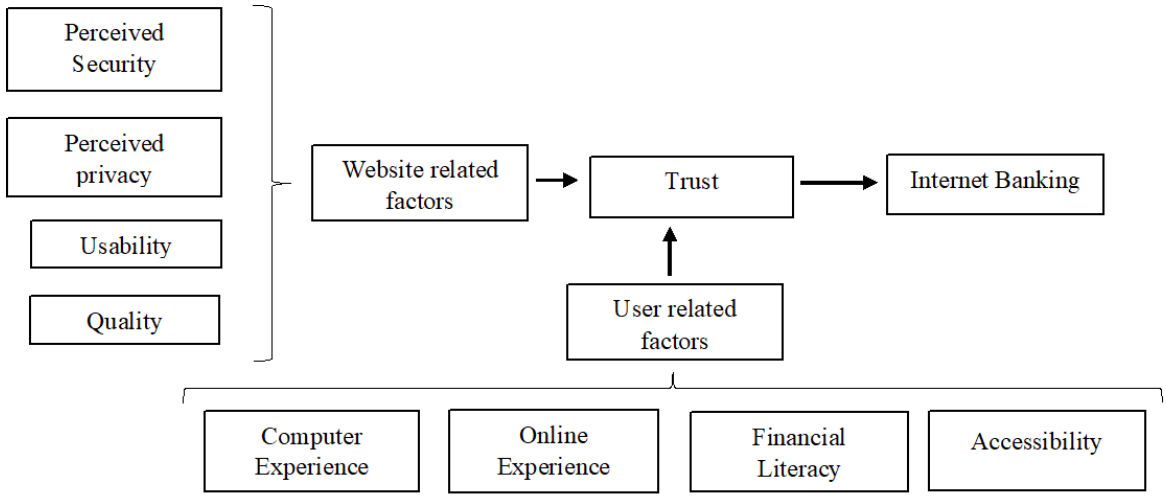

Figure 3.1 - Research Model

Therefore, this research purposes to answer the following research questions:

RQ1: Does customers' trust influence the experience with online banking?

RQ2: What is the level of customers' trust when using banks' websites?

RQ3: Do customers' perceived security and privacy when using banks' websites affect their level of trust?

RQ4: Are website quality and usability important aspects for customers' trust?

RQ5: Do customers' accessibility to a computer and internet affect their trust in online banking?

RQ6: To what extent is experience with the online world an important aspect of customers' trust in online banking?

RQ7: Does computer basic knowledge a factor that has an impact on customers' level of trust in continue using online banking services?

RQ8: Is financial literacy a characteristic of the user fundamental to accomplish a different level of trust in using online banking services?

To address the previously stated research questions, a set of hypotheses was elaborated founded on the literature. From extensive research on the prior concepts and theories, the hypotheses to be tested are related to trust in online banking adoption and factors that influence customers' trust in using banks' websites.

H1: Customers' trust level is related to customers' online banking integration.

H2: Perceived security positively influences trust towards the adoption and continued use of banks' websites.

H3: Perceived privacy positively influences trust towards the adoption and continued use of banks' websites.

H4: The usability of the banks' website positively influences trust towards the continued use of Internet banking.

H5: The website' quality positively influences trust towards the adoption and continued use of online banking services.

H6: Customers' proper and direct access to a computer and to the internet positively influences trust towards the use of banks' websites.

H7: Customers' experience and confidence level with the online world is positively related to the level of trust on online banking adoption and continued use.

H8: Customers' knowledge of computer usage is positively related to the level of online banking adoption and continued use.

H9: The level of financial literacy is positively related to the level of online banking adoption and continued use.

3.2 Data Collection

The methodology used to collect data was through an online survey, using Qualtrics, having the objective of addressing the questions and verifying the hypotheses proposed in the previous section, and was distributed online through some social media platforms like Facebook, Instagram, LinkedIn, and Whatsapp.

The survey was released on the 13th of June and was available until the 3rd of August. Participants were asked several questions concerning their Online banking adoption and usage, their experience and ease with computer devices and the online world, the level of financial literacy they consider having, their proper and direct access to a computer and the internet, and their experience with online banking services, more precisely, their perception of security, privacy, and trust, when working with the banks' websites. Overall, the survey consists in seven parts where each part could have from four up to six questions. All questions vary in format from multiple choice to scale (using a 5-point Likert scale) and are easily coded which facilitates subsequent analysis. Apart from questions aimed to address the hypotheses, demographic and social questions were integrated into the survey. To increase the confidence of the participants, the survey was confidential and answered anonymously. The final version of the online questionnaire can be found in Appendix A.

Parts of the questionnaire for the thesis were developed based on previous studies. The last three sections, about Perceived Security, Perceived Privacy, and Trust, were adapted from the study of Maimunatu Ya'u et al. (2021), about Security and Privacy Dimension as Predictor of Internet Banking E-Service quality on customer trust. Also, the section on Financial Literacy was based on a report from Banco de Portugal (2010), about the analysis of a published survey on the financial literacy of the Portuguese population.

Before the distribution of the questionnaire, a pilot test with 10 users was performed in order to confirm the content validity and precision and change some spelling and other errors.

In the next chapter, the analysis of the data gathered is performed. To analyse the questionnaire results, the SPSS software will be used to perform a series of statistical tests on the independent and dependent variables.

4. Data analysis

4.1 Sample characterization

In this chapter, the analysis of the outputs of the survey will be carried out. To start, the sample description is going to be presented. The questionnaire has six questions addressing sample description. The first five were about socio demographic matters, age, gender, educational level, current situation and level of monthly income. Since the questionnaire intends to only evaluate the experience of customers' who use online banking, to understand if trust influences their level of online banking integration and which factors could affect their level of trust related with online banking services, the last question is "Do you use online banking?", and the survey would end for the individuals who answered "No". There were 355 valid answers to the questionnaire, from which 58 individuals answer that they did not use online banking services, representing 16.34% of the responses. The sample of this study consists of a total of 297 participants who use online banking services.

Figure 4.1 illustrates the participants' age. Most individuals are aged between 18 and 34 years old, more precisely 60.3%.

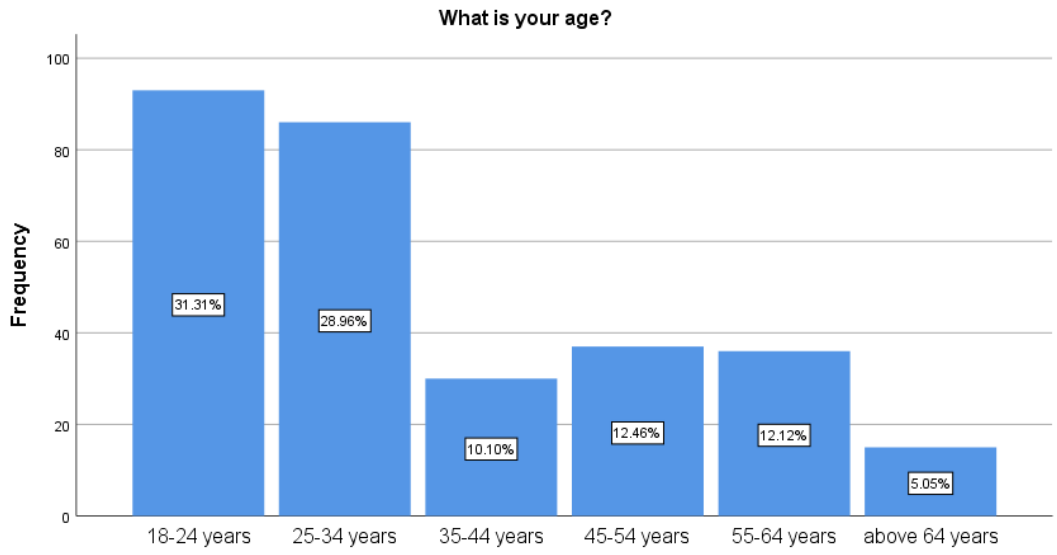

Figure 4.1 – Age of the respondents
Source: SPSS data output

Considering the gender of the participants, Figure 4.2 shows that more than half of the participants are females, more exactly 61.15%, and 38.85% are males.

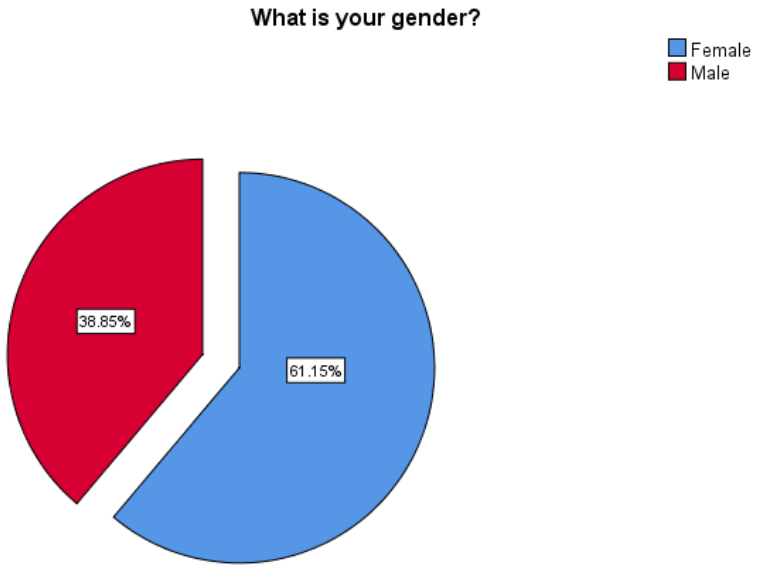

Figure 4.2 – Gender of respondents
Source: SPSS data output

Related to the educational levels of the respondents, Figure 4.3 indicates that the majority is highly educated since around 40% have a master's degree or higher. Just below are respondents with a bachelor's degree, representing 24.58% of the sample. The participants without a college education represent 18.85% of the sample.

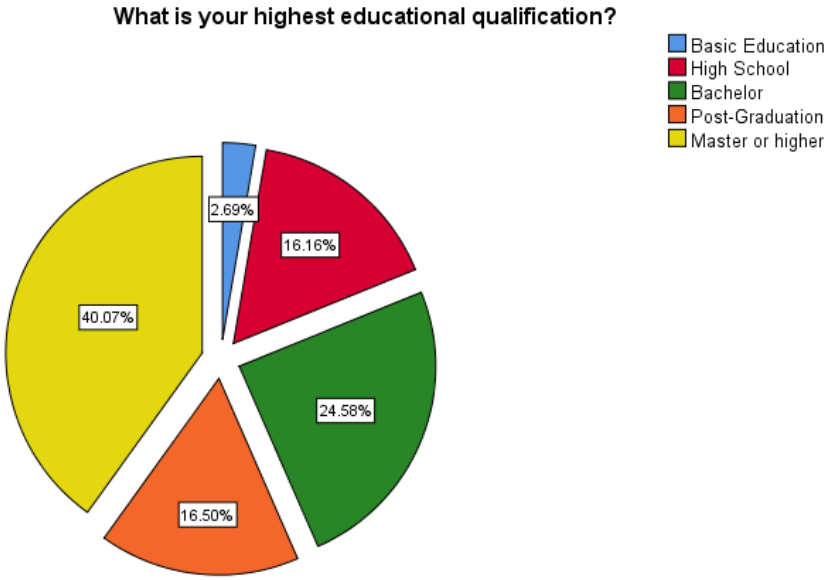

Figure 4.3 – Respondents Level of Education
Source: SPSS data output

Concerning the current situation of the participants, considering Figure 4.4 the majority is employed full-time, representing 62,3% of the responses. Follow by the participants that are still studying being 25,3% of the sample. Only 2 of the respondents are unemployed.

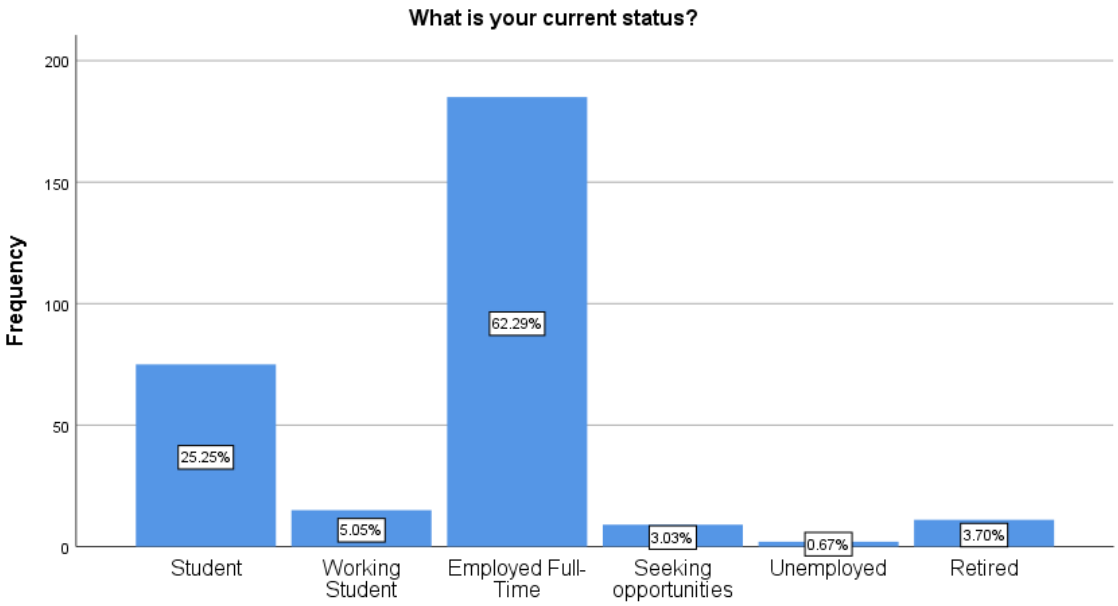

Figure 4.4 – Respondents current status
Source: SPSS data output

In reference to the respondents net monthly income, Figure 4.5 indicates that most of the participants have an income between 1200 and 3000 euros per month, accounting for 102 of the respondents (a percentage of 34,3%). The second largest group is the people who are still studying and do not have a source of income, being 22,6% of the sample. Follow by the individuals who earn between 800 and 1200 euros per month, with 20,2% of responses.

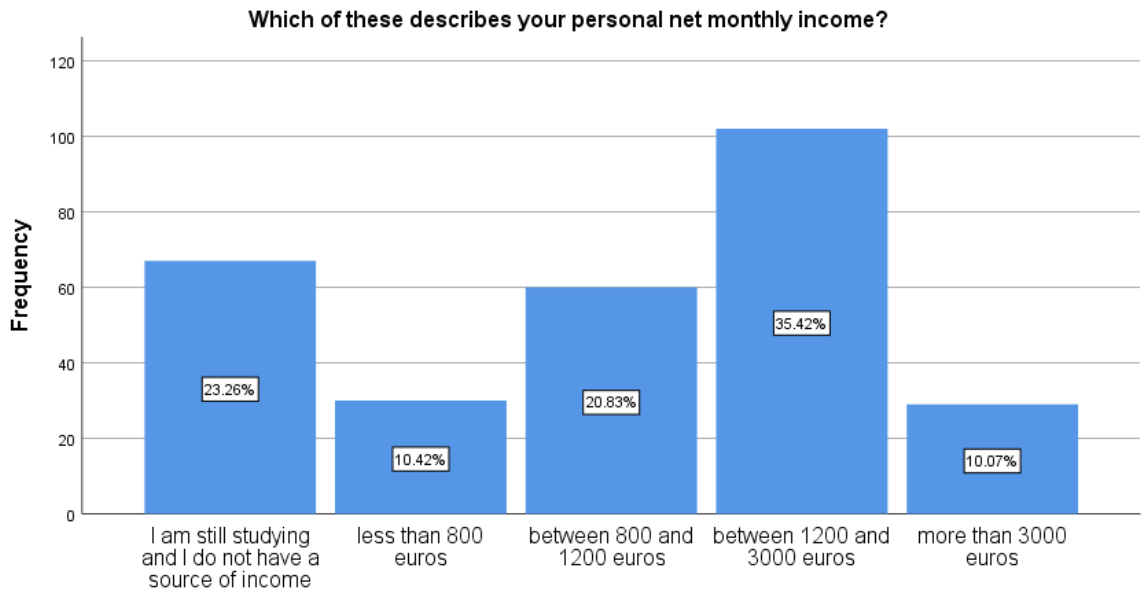

Figure 4.5 – Respondents net monthly income
Source: SPSS data output

4.2 Quantitative content analysis

4.2.1 Online Banking Integration

After the socio demographic questions, section 3 from the questionnaire intends to investigate how integrated are the participants with online banking services. The first question is "How long have you used online banking?". Considering Figure 4.6, most of the individuals use online banking for 1-3 years, representing 34.7% of the responses. Follow by the people who use the channel for more than 6 years with a percentage of 32.7%. As for individuals who embraced online banking in the lasts 4-6 years, it accounts for 27.3% of the sample. And finally, 5.4% of the individuals started using online banking in the last year.

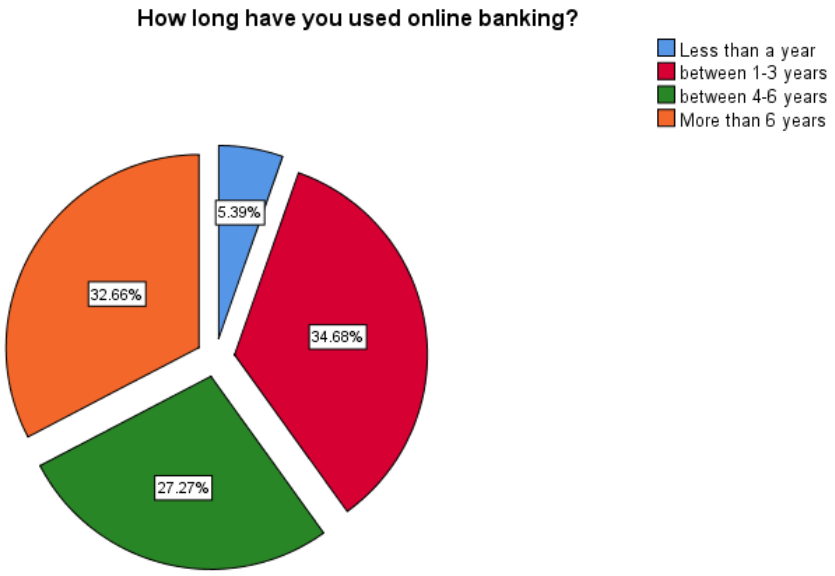

Figure 4.6 – Online banking time usage
Source: SPSS data output

The second question that intends to evaluate how integrated are the respondents with online banking is in relation to the frequency of banks' websites monthly usage. As Figure 4.7 shows, the majority of the respondents answered "very frequently" (representing 40,4% of the sample). Secondly, are the people that use banks' website between 8 to 12 times per month, accounting for 82 responses (a percentage of 27,6%), followed by the participants that only use it occasionally, with a percentage of 56% of the sample. The respondents that use the channel rarely only represent 11,1% of the responses. Lastly, the people who use the services very rarely with 6 answers.

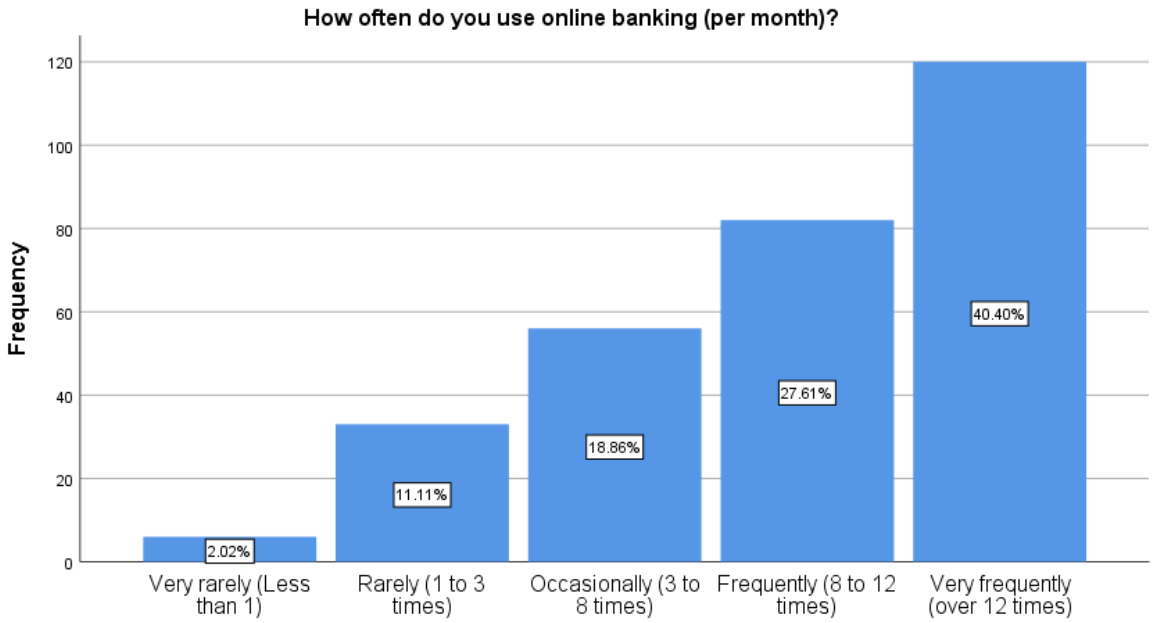

Figure 4.7 – Respondents online banking usage (per month)
Source: SPSS output data

In the same section it was asked about the services that participants use through online banking. The banking services more selected were bank transfer, making online bill payments, basic account information and accounting check balance. The services less selected were stock trading and applying for cheque books.

Plus, the survey asked the participants about their preferred methods of performing banking transactions (Table 4.1). From the sample, around 47% of the participants preferred to pursue banking transactions through mobile banking as first option. Followed by ATM as a first choice to execute a transaction. Online banking services is the first option to perform banking transaction to only 48 of the individuals of the sample.

Table 4.1 – Preferred methods of performing banking transactions

	N
Online banking services	48
Mobile banking	139
ATM	92
Go to a bank	18
Total	297

4.2.2 Reliability of the constructs

According to the literature, some factors are perceived to influence customer trust in online banking services. More precisely, two different groups of factors: the first group related to banks' website characteristics and the second group related to users' characteristics. All of the components were measured through different items. Participants were asked to answer some indicators on a five-point Likert Scale. All the data were treated using the software IBM SPSS Statistics.

Prior to calculating the mean and standard deviation of each item to observe each construct, it is important to measure the reliability of the constructs using the Cronbach's α coefficient. This coefficient is used to express the internal consistency of the items. According to DeVellis (2003) the Cronbach's alpha coefficient of a scale should be above 0.7.

This coefficient of dependability, according to Tavakol and Dennick (2011), expresses the degree to which a group of items measure the same idea, with values varying from 0 to 1, where values closer to 1 correspond to higher correlations.

Table 4.2 – Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	**N of Items**
.835	8

Table 4.3 – Mean, Standard Deviation, and Cronbach's Alpha of the Variables

Variable	**Mean**	**Std. Deviation**	**Alpha if Item Deleted**
Security	3.58	.687	.809
Privacy	3.59	.763	.819
Quality	4.01	.856	.820
Usability	3.97	.875	.817
Accessibility	4.55	.770	.806
Computer Experience	4.10	.932	.818
Online Experience	4.21	.858	.802
Financial Literacy	3.75	.804	.831

Table 4.2 shows the Cronbach's Alpha value through the reliability statistics table, with a value of .835, suggesting very good internal consistency reliability for the scale with this sample. Values above 0.7 are considered acceptable; however, values above 0.8 are preferable.

The variables presented in Table 4.3 were obtained by calculating the arithmetic mean of the corresponding indicators. Through the interpretation of table, in the column "Alpha if Item Deleted", it is possible to verify the impact of removing each item from the scale is given. Comparing the values in the column with the final alpha value represented in Table 4.2, all eight values are lower than .835, meaning that there is no reason to consider removing any construct from the scale. According to the same data, the mean values of these variables range between 3.5 and 4.5, corresponding to rather high values.

From Table 4.3, it is presented that most participants have proper and direct access to a computer and to the internet (M=4.55). Related to variable Online Experience the mean of the items of the construct is 4.21, meaning that users are widely comfortable with the online world. The Computer Experience variable has the third highest mean (M=4.10), which means that most individuals know how to work and had experience with computers. Related with the quality of the bank's website (M=4.01), respondents are in general satisfied with the quality of online services provided. However, in terms of usability of the website, the mean value is lower (M=3.97), meaning that customers' answers were in the neutral range related with the ease of the online services provided by banks. The variable Financial Literacy has a mean of 3.75, which means that respondents tend to the neutral side when asked about their level of financial literacy, but are in a way more inclined to agreeing having a good level of financial literacy. Finally, regarding the two constructs of Perceived Security and Privacy, with mean values of 3.58 and 3.59 respectively, participants answered in a neutral way about questions of security and privacy related to banks' websites.

All variables present low values of standard deviation, except for computer confidence that has a value close to 1.

As explained in the methodology, the constructs were measured using different items. To understand and measure the results obtained with the questionnaire, descriptive statistics for each construct (mean and standard deviation) were performed in the following sections.

4.2.3 Perceived security

Following the measured reliability of the constructs, each item is analysed by calculating the mean and standard deviation. All items are measured with a scale from 1 (Strongly agree) to 5 (Strongly disagree).

Table 4.4 – Descriptive statistics for the construct Perceived Security

Variable	Mean	Std. Deviation
Online banking has mechanisms to guarantee the safety of its users' information.	3.82	.816
Online banking has sufficient technical capacity to guarantee user's information cannot be changed by hackers.	3.35	.857
Online banking services do not represent financial risk.	3.02	1.048
Making e-payments on online banking platforms is safe.	3.68	.803
I feel comfortable about the security of financial transactions made through online banking.	3.80	.833
I trust the security measures of my online banking services.	3.80	.825

As it is possible to observe from Table 4.4, the mean values for Perceived Security' items range between 3.02 and 3.82, suggesting that participants tend to be more neutral regarding this construct. The lowest mean value is represented by "Online banking services do not represent financial risk." (M=3.02), which means that online banking is still a service that is thought by individuals as possessing some level of risk. However, the same item has a standard deviation higher than 1, pointing to a relevant deviation of responses from the mean.

4.2.4 Perceived privacy

Perceived Privacy was measured using 6 different items. The mean and standard deviation values are shown in Table 4.5.

Table 1.5 – Descriptive statistics for the construct Perceived Privacy

Variable	Mean	Std. Deviation
Online banking services stand by personal data protection law.	3.73	.843
Online banking only collects users' personal data necessary for the transaction.	3.43	.921
Online banking does not provide my personal information to others without my permission.	3.55	.996
Online banking shows concern for the privacy of its users.	3.70	.891
Online banking services have good privacy policies.	3.63	.856
My personal information will not be misused.	3.47	.885

According to Table 4.5, it is possible to conclude that the mean values range between 3.43 and 3.73, which indicate that, overall, the participants are neutral concerning this construct. Also, all the items' standard deviation are below 1, concluding that most responses are close to the mean.

4.2.5 Usability and Quality

From Table 4.6, it is possible to analyse the descriptive statistics for two constructs: Usability and Quality.

Table 4.6 – Descriptive statistics for Usability and Quality

Variable	Mean	Std. Deviation
The website is easy and simple to navigate.	4.08	.941
I easily achieve my research and acquire complete information exactly to enhance my decision-making process through the website.	3.86	.969
I am satisfied with my bank's website.	4.01	.856

All the mean values are close to 4, between 3.86 and 4.08. The highest mean value is related to the usability construct (M=4.08), meaning that, overall, all participants agree that the banks' websites are easy and simple to navigate. Follow by the item related to quality, "I am satisfied with my bank's website." with a mean value of 4.01, which means that individuals are in general satisfied with the website provided by banks. However, the second item of the table, also related to usability, has a lower mean of 3.86, stating that respondents still find it difficult to enhance their necessities through the websites with the information given. But is important to note that the second item also has a standard deviation very close to 1.

4.2.6 Accessibility, Computer and Online Experience

Concerning Table 4.7, the items from Accessibility, Computer, and Online Experience are analyse.

Table 4.7 – Descriptive statistics for Accessibility, Computer, and Online Experience

Variable	Mean	Std. Deviation
I have proper and direct accessibility to a computer and to the Internet.	4.55	.770
I have a good level of computer knowledge.	4.10	.932
I feel comfortable with the online world.	4.16	.900
I often use online means for other activities (for example, online shopping),	4.27	.994

All three items have a mean value above 4, meaning that participants not only have a proper and direct access to a computer and to the internet, but they are comfortable using both. Also, the standard deviation values are below 1, expressing responses closer to the mean. Except for the last item, “I often use online means for other activities”, with a standard deviation below but close to 1, which means that participants have different levels of online integration with other activities.

4.2.7 Financial Literacy

Table 4.8 represents the construct Financial Literacy using three items.

Table 4.8 – Descriptive statistics for Financial Literacy

Variable	Mean	Std. Deviation
I considered several products/loans/policies/accounts from different companies before making my decision.	3.49	1.109
Before I buy I carefully consider whether I can afford it.	4.25	.899
I consider having a good level of financial literacy.	3.51	.987

The mean values are situated between 3.49 and 4.25. Generally, participants carefully consider whether they can afford something before buying it. For the other items, individuals tend to be neutral about the statements. However, for those items, the standard deviation values are either greater than 1 or very close to 1.

4.2.8 Trust

The last construct’ main goal is to measure the level of trust in online banking services. Therefore, participants were asked to answer 6 questions regarding trust when using banks’ websites. Table 4.9 represents the construct’s results.

Table 4.9 – Descriptive statistics for Trust

Variable	Mean	Std. Deviation
With adequate safety measures on my bank website, I do not hesitate to enter my credit card info.	3.41	1.029
I am prepared to give my private info for my transactions done through online banking.	3.28	.987
I trust my bank on my transactions done through the website.	3.79	.859
Transactions through online banking always function as expected.	3.64	.905
I believe my transactions through the website are likely to be secure.	3.80	.860
I trust the services provided through online banking.	3.83	.802

All the mean values are in the range 3, demonstrating that the participants tend to be neutral about the statements. However, for example the first item, ("With adequate safety measures on my bank website, I do not hesitate to enter my credit card info.") has the second lowest mean but a standard deviation greater than 1, meaning that respondents have different opinions regarding trust in online banking services. For the rest of the items, all standard deviation values are below 1, which means that the answers are closer to the mean.

4.2.9 Regression analysis

Regression analysis is a popular method used to explore the relationship between one continuous dependent variable and several independent variables (Pallant, 2013). Meaning that the regression analysis is used to verify if the dependent variable can be explained through the independent variables. Hence, multiple regression analyses were performed to analyse and confirm the stated hypotheses in the Chapter 3.

Multiple Regression has a number of assumptions about the data that must be gathered to pursue the test: the linearity of the correlation between each independent variable and the

dependent variable; the residual component's mean of the model is zero; the independent variables are not correlated with the residual terms; there is no correlation among the residual terms; the variance of the random term is constant; normality of the residuals; and the absence of multicollinearity between variables.

If the coefficient of one of the independent variables X is different from zero, it affects the dependent variable Y, hence is significant to the model. Therefore, is required to test the coefficients B. The hypotheses for X (independent variable) are:

- H0: the coefficient is equal to zero.
- H1: the coefficient is different from zero.

After pursuing the test, the hypotheses H0 will only be rejected if sig < 0.05, inferring that the independent variable associated with the coefficient affects the dependent variable and is significant to the model. It should be noted that all tests presented have a significance level of 0.05.

The conceptual model was created in a way that the variable Trust work as a predictor between the characteristics of the banks' website (Perceived Privacy, Perceived Security, Usability, and Quality) and the characteristics of the customers (Accessibility, Computer and Online Experience, and Financial Literacy).

4.2.9.1 Verification of Multiple Regression Analysis' Assumptions

Firstly, it was required to confirm the existence of linear relationship between the dependent variable and the independent variables used. This was done by obtaining a scatterplot, as shown in Appendix E, that suggested a positive linear association between the dependent variable Trust and all the independent variables used. By creating a correlation matrix (see Appendix C) is possible to examine the Pearson Correlation Coefficient (r), that measures the intensity and direction of the linear association between variables. The value varies between -1 and +1. Values close to -1 imply a strong and negative correlation, while values close to +1 suggest a strong and positive linear association.

From Table 4.10 it is possible to conclude that all variables are statistically significant to 0.05. There is a positive linear correlation between the variables Perceived Privacy (r=0.630) and Perceived Security (r=0.674) with Trust, representing the highest values. On the other hand, the variable Financial Literacy has a weak correlation (r=0.272) with Trust. As for the other variables, Usability, Quality, Computer Experience, Accessibility and Online

Experience, the Pearson Correlation Coefficient also demonstrates a weak correlation with Trust, but not so low as for Financial Literacy.

Table 4.10 – Simple Linear Regression

		USAB	QUAL	COMPEXP	ACCES	ONLEXP	FL	PSEC	PPRIV
TRUST	**Pearson Correlation**	.351	.313	.303	.420	.418	.272	.674	.630
	Sig (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
	N	297	297	297	297	297	297	297	297

Secondly, assumptions concerning the residuals (errors) were verified and presented in Appendix E. To evaluate if the residuals have a normal distribution, a Kolmogorov-Smirnov goodness-of-fit test was performed on the standardized residuals obtained in the analysis. A value of $p = .076$ was obtained, thus we can assume that residuals have a normal distribution. After that, an evaluation was made considering if residuals have a mean of zero and by examining the residuals statistic table, we were able to confirm this to be true. This was possible to observed, through a scatterplot created, and as there is no evident pattern in the scatterplot and its dots are randomly scattered, we can assume the residuals have constant variances. Regarding residuals' independence, this assumption is only relevant when there is a chronological order in the data, thus this assumption was not checked.

Finally, the absence of multicollinearity between variables was analyzed. For this assumption to be checked all independent variables' values for Tolerance (TOL) should generally be above 0.1 and all values for Variance Inflation Factor (VIF) should generally be below 10. Since all these conditions were met, we can assume there is no multicollinearity.

All the evidence to confirm all the assumptions are presented in the Appendix E.

4.2.9.2 The Determinants of Trust

With all required assumptions validated it is possible to perform a multiple linear regression analysis in order to test the hypothesis and validate the research model.

Table 4.11 describes the model's summary. It is possible to conclude, by evaluating the table, that 54,1% of the variability of Trust is explained by the independent variables in the model.

Table 4.11 – Multiple Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.0736	.541	.529	.506	2.084

a. Predictors: (Constant), USAB, QUAL, COMPEXP, ONLEXP, ACCES, FL, PSEC, PPRIV
b. Dependent Variable: TRUST

Subsequently, a ANOVA test for Linear regression was executed, to assess the model's validity (Table 4.12).

In this test, the null hypothesis predicts that all β are equal to zero whereas H1 states that they are all different from zero. From the results indicated in Table 4.12, once $p = .000$ (<0.05) we reject H0 and conclude that the model is valid and that the explanatory variables are useful to explain Trust and should be kept in the model.

Table 4.12 – ANOVA's test results

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	87.065	8	10.883	42.488	.000[b]
	Residual	73.769	288	.256		
	Total	160.834	296			

a. Dependent Variable: TRUST
b. Predictors: (Constant), USAB, QUAL, COMPEXP, ONLEXP, ACCES, FL, PSEC, PPRIV

Concerning the impact that each independent variable has on Trust, this can be analyzed with the multiple regression results (Table 4.13).

From Table 4.13, it possible to observe that the results from the test show that from all the constructs only Perceived Security, Perceived Privacy and Accessibility are statistically significant to the model and have a direct impact on Trust, since the p-values are lower than 0.05 (Reject H0). The unstandardized coefficients (B) allow the researcher to compare the average effect of each independent variable on the dependent variable. A unit increase in websites' security would lead to an increase of .447 in consumers' trust.

Table 4.13 – Multiple Regression Model Summary

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**T**	**Sig.**
(Constant)	.412	.217		1.898	.059
QUAL	-.029	.060	-.034	-.491	.624
USAB	.054	.059	.064	.911	.363
COMPEXP	.056	.048	-.070	-1.150	.251
ACCES	.108	.054	.112	1.991	.047
ONLEXP	.096	.059	.112	1.623	.106
FL	-0.55	0.41	-.060	-1.326	.186
PSEC	.447	0.62	.417	7.223	.000
PPRIV	.295	0.52	.305	5.674	.000

4.2.10 Independent samples t-test

One of the questions from the survey was about the financial products that individuals own. The question purpose was to study the level of financial literacy of the respondents, because it is assumed that someone that owns stocks and shares will have a higher level of financial literacy.

For this matter an independent t-test was performed to confirm the equality of means of the two groups of individuals, the ones that own stocks and shares and the ones who do not.

For this test, similar to the regression analysis, some assumptions must be met. The dependent variable should be approximately normally distributed for each group of the independent variable. According to the Central Limit Theorem, groups are approximately normal if the sample size is larger than 30.

The test output is different depending on Levene's test for homogeneity of variances results. The null hypothesis for this test is H0:"The populations under consideration have equal variances" and H1: "The population has different variances". If sig. < 0.05, the null hypothesis is rejected, and it can be concluded that the two populations have different variances. Regarding the Independent samples t-test, the hypotheses are: H0: "The population means from the two groups are equal". H1: "The population means from the two groups are not equal". If sig. < 0.05 the null hypothesis is rejected, and it can be considered that the population means are not equal.

Table 4.14 – Independent samples t-test (Shares and Stocks)

	Levene's test for equality of variances		t-test for Equality of Means				
TRUST	**F**	**Sig**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	.021	.885	-.907	295	.365	-.106	.117
Equal variances not assumed			-.901	64.159	.371	-.106	.118

All the assumptions were met before proceeding to the test. Since n>30, according to the Central Limit Theorem, approximate normality can be assumed.

Regarding Levene's test for equality of variances, since sig.>0.05, we do not reject H0. It makes sense because if stocks and shares represent financial literacy, this construct was already stated to be not relevant to the model, as it is represented in the regression model.

Another question was about customers' experience with Neobanks', banks who work without any physical branch, only from online means, which characterize the customers into the more involved with online banking adoption and the ones not so involved.

Table 4.15 – Independent samples t-test (Neobanks)

	Levene's test for equality of variances		t-test for Equality of Means				
TRUST	**F**	**Sig**	**T**	**Df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	.407	.524	-3.127	295	.002	-.280	.090
Equal variances not assumed			-3.235	211.377	.001	-.280	.087

The test of equality of means has a significance of .002, which is smaller than alpha (0.05). Thus, we reject H0 and conclude that the means of the populations are significantly different. Given this output, it can be said that individuals with different levels of trust have different perspectives to use online banking. More precisely, the individuals who have used a Neobank have different levels of trust than the ones that have never used a Neobank.

4.2.11 One-way ANOVA

While the T-test is used to compare the means of two different groups or items, the analysis of the means of more than two groups are done through an analysis of variance (ANOVA). ANOVA is a statistical technique that is used to verify if the means of the groups are significantly different from each other.

In this test, the null hypothesis (H0) is valid when all the sample means are equal, whereas H1 states that the sample means are different. The null hypothesis is rejected if sig. < 0.05.

One of the questions from the survey was about the preferred channel to perform transactions. Figure 4.16 shows that the preferred channel is Mobile Banking (N=139). Plus, it is possible to analyse that individuals tend to trust more their transactions done through Mobile Banking (M=3.72) or ATM (M=3.66), while trust in online banking services to perform transactions has the lowest mean of the 4 channels (M=3.32). Important to note that the two highest means of trust are the ones for channels that participants prefer to perform their transactions.

Table 4.16 – Trust and Preferred channel to perform transactions

TRUST	**N**	**Mean**
Online banking	48	3.32
Mobile banking	139	3.72
ATM	92	3.66
Go to a bank	18	3.56
Total	297	3.63

Regarding the test assumptions. Since samples' dimension are large, it is possible to use the Central Limit Theorem to ensure the normality distribution. Also, from the test of homogeneity of variances, is showed that variances are equal (accepting the null hypotheses). Lastly, all samples are independent.

Other question from the questionnaire was about the frequency of online banking service usage per month by the participants, and a ANOVA test was performed, after checking all the assumptions to execute the test, in order to understand if there is a difference of customers trust in different level of frequencies.

Figure 4.17 states that the mean of trust for individuals who use online banking services very frequently is the highest (M=3.83). And, for the ones who use it less than 1 time per month represents the lowest mean of trust (M=2.94).

Table 4.17 – Trust and frequency of online banking services usage per month

TRUST	N	Mean
Very rarely (less than 1)	6	2.94
Rarely (1 to 3 times)	33	3.39
Occasionally (3 to 8 times)	56	3.48
Frequently (8 to 12 times)	82	3.58
Very frequently (over 12 times)	120	3.83
Total	297	3.63

5. Results and Discussion

5.1 Validation of hypotheses

The previously chapter presented the results on the main objective of studying the determinants of consumers' trust in online banking services. This chapter focuses on validating the research hypotheses formulated in the third chapter, taking into account the results analysed in the data analysis.

The results from the tests performed and presented in the last chapter may be used to determine if there is a significant linear relationship between the independent and dependent variables.

5.1.1 Hypothesis regarding adoption of online banking

Hypothesis 1 (H1) intends to analyse if customers' level of trust is related to customers' online banking integration. It was tested using an independent samples t-test and an ANOVA test.

The independent samples t-test, shown in Table 4.15, indicates that the means of the variables are different (sig. <0.05), meaning the customers' level of trust are different in the two groups of respondents. Considering the results, H1 is validated.

Also, an ANOVA test was performed, as shown in Table 4.17. Since sig.<0.05, it is possible to assume that the means of the variables are different, which means that customers' trust does change in the different groups of participants. Which also validates H1.

5.1.2 Hypotheses regarding website characteristics

Hypothesis 2 (H2) aims to analyse if perceived security influences trust in banks' websites. A Multiple Linear Regression analysis was performed (Table 4.13) and, since p = .000 (<0.05), the null hypothesis is rejected meaning that the coefficient of this variable is different from zero. Thus, H2 is accepted, which means that, as expected, perceived security has an influence on trust in banks' websites. The value of the coefficient B is .447, showing a positive relationship between the variables. If perceived security is increased by one unit, customers trust in online banking services will increase .447 units.

Hypothesis (H3) intends to evaluate if perceived privacy influences trust in online banking services. From Table 4.13, it is possible to conclude that since p = .000 (<0.05) the null hypothesis is rejected, demonstrating that the coefficient is different from zero. Therefore, H3 is also accepted, meaning that perceived privacy influences customers' trust when using banks' websites. The B is equal to .295, indicating a positive relationship between the variables. An

increase of perceived privacy by one unit represents an increase of .295 units in customers' trust.

Regarding H4, that predicts a positive influence between websites usability and customers' trust, results show that p = .363, meaning the null hypothesis is not rejected. The variable usability is not relevant to explain the dependent variable. Hence, H4 is not supported, suggesting that websites' usability does not have an influence in customers' trust.

Concerning H5, it expects that websites' quality will influence customers trust when using online banking services. Since the p = .624, the null hypothesis is not rejected and it is concluded that this variable is not relevant the dependent variable. Thus, H5 is not validated.

5.1.3 Hypotheses regarding customer characteristics

H6 states that customers proper and direct access to a computer and to the internet influences customers' trust in banks' websites. As shown in Table 4.13 since p = .047 (<0.05) the null hypothesis is not rejected. Therefore, H6 is accepted, supporting that a proper and direct access to a computer and to the internet influences customers' trust in using online banking. The β=0.108 shows that if there is an increase of one unit of accessibility to the internet, customers trust will increase on average .108 units.

Considering H7, the aim is to analyse if customers' experience and confidence level with the online world influences customers' trust in using banks' websites. According to the statistical test results of a p = .106, the null hypothesis is not rejected and the variable online confidence is not relevant to the dependent variable. The H7 is rejected, inferring that the level of customers' experience and confidence with the online world do not influence customers' trust in online banking services.

Hypothesis 8 predicts that the level of comfort with computers usage influences customers' trust. Through Table 4.13 it is possible to conclude that the null hypothesis would not be rejected since p = .251, and the construct will not be relevant to explain the dependent variable. Hence, H8 is not validated.

Lastly, hypothesis 9 (H9) suggests that the customers' level of financial literacy has an influence on customers' trust in banks' websites. However, the significance of the variable's coefficient is .108, which is higher than 0.05, meaning that the null hypothesis is not rejected, and the variable financial literacy is not relevant to the dependent variable. Plus, the tests represented in Table 4.14 also proves that financial literacy is not relevant to the model. Given this outcome, H9 is not validated.

5.2 Summarized results

Table 5.1 – Summary results of the hypotheses

Hypotheses	Statistical test/method	Conclusion	Annexes
H1. Customers' trust level is related to customers' online banking integration.	Independent Samples t-test and ANOVA test	Supported	Appendix F and G
H2. Perceived Security positively influences trust towards the use of banks' websites.	Linear Regression	Supported	Appendix E
H3. Perceived Privacy positively influences trust towards the use of banks' websites.	Linear Regression	Supported	Appendix E
H4. The usability of the banks' website positively influences trust towards the use of Internet banking.	Linear Regression	Not Supported	Appendix E
H5. The website' quality positively influences trust towards the adoption and continue use of online banking services.	Linear Regression	Not Supported	Appendix E

Table 5.1 – Summary results of the hypotheses

Hypotheses	Statistical test/method	Conclusion	Annexes
H6. Customers' proper and direct access to a computer and to the internet positively influences trust towards the use of banks' websites.	Linear Regression	Supported	Appendix E
H7. Customers' experience and confidence level with the online world is positively related to the level of trust on online banking adoption and continue use.	Linear Regression	Not Supported	Appendix E
H8. Customers' knowledge of computer usage is positively related to the level of online banking adoption.	Linear Regression	Not Supported	Appendix E
H9. The level of financial literacy is positively related to the level of online banking adoption.	Linear Regression & Independent Samples t-test	Not Supported	Appendix E and F

5.3 Results discussion

The purpose of this dissertation is to study the level of trust and concerns when pursuing activities through online banking from the Portuguese banks' customers. More precisely, understanding the factors that could affect customers' trust, from factors related with the characteristics of the website itself to factors related to the characteristics of the user. Therefore, a literature review was developed to identify the main factors that can influence customers trust to use online banking services and to later study those characteristics. In this section, the findings from the study and the results from the literature review will be analysed and compared.

First, the results obtained confirm that customers' level of trust influences the adoption of online banking integration. The results are in line with Ezzi (2014) and Safeena et al. (2014)

that consider trust a determinant factor related to the use of banks' websites. Besides, the test represented in Table 4.16 shows that Online banking is not the first choice to perform transactions to many of the participants and that the two highest means of trust are the ones for channels that participants prefer to perform their transactions as first choices (Mobile Banking and ATMs), proving the important role of trust.

Also, important to note, that according to the descriptive statistics for the construct trust, all the mean values are in the range 3 (Table 4.9), meaning that the participants tend to be neutral about the items of trust. Hence, when analysing the level of trust and concerns by the Portuguese when pursuing activities through online banking it is possible to see that individuals still have a lot of receptiveness regarding online trust with respect to trusting the service. The same could be said related to questions of security and privacy, as it is possible to see from the descriptive statistics of both constructs in Table 4.4 and 4.5, respectively.

Regarding the group of factors related to the banks' website, the results indicate that perceived security is an important factor to accomplish trust in online banking, as explained in the previous section, in line with Bargh et al. (2002), which find security, in a broad sense, to be a major contributor of the general trust in e-business. In the same way, perceived privacy is also recognized to be a determinant to develop trust in online banking, as stated by Yousafzai et al. (2003), that observed that the perception of privacy did have a significant positive impact on trust. Furthermore, results do not confirm that usability and quality have significant effects upon trust, opposite to what Gourdarzi et al. (2015) concludes in their study.

Concerning the users' characteristics group of factors, and as referred by Costante et al. (2011) in their study, the higher the knowledge, the higher the trust. Gourdarzi et al. (2015) explore a sequence of factors related to users' characteristics, being one of them computer knowledge. The present study results have determined computer knowledge as not being a relevant construct to study trust in online banking.

Research by Bart et al. (2005) has shown that customers' level of Internet experience and their degree of trust in an electronic commerce environment are positively related together. However, the present research results do not confirm that online confidence has an influence on trust in online banking services.

Lastly, Biklsma et al. (2022) stated that a higher degree of financial literacy coincides with higher trust in banks' services. From the results obtained, developed financial literacy is not a relevant construct to developed trust in online banking services.

6. Conclusions and Recommendations

This chapter intends to present the major findings of this study from both a theoretical and practical perspective, as well as some limitations discovered during the research and potential future research.

6.1 Overall findings

This research aims to explore the level of customer trust in online banking services. More precisely to comprehend which determinants influence customer trust in using banks' websites. Consequently, a detailed literature review was conducted, focusing on two groups of factors that could influence trust in online banking, one group related to banks' website characteristics and other group related to users' characteristics. Several hypotheses were formulated and tested.

All the variables were tested through a quantitative approach, by the distribution of an online questionnaire. A total of 355 valid answers were collected, from which 297 were analyse for the trust influence corresponding to the number of respondents that answer "Yes" to the question "Do you use online banking?". The sample is characterized by individuals aged between 18 and more than 64 years old, and most participants were aged between 18 and 24 years old (31.3%). Plus, more than half of the participants using online banking services are females (61.15%). The majority of the individuals hold a master's degree or higher (40,07%) and are employed full-time (62.29%). Regarding the monthly net income, the largest group of individuals earn between 1200 and 3000 euros (35.42%). Online Banking adoption and Usage

In order to evaluate how integrated the participants are with online banking services a number of questions were asked after the demographic section. Concerning how long the individuals use online banking services, most participants use online banking for 1-3 years (34.7%), following by the ones that use the channel for more than 6 years with a close percentage of 32.7%. Relative to the frequency of banks' websites monthly usage by the participants, the majority of the individuals use the channel very frequently (40,4%). Regarding the services that participants use through online banking, most participants selected bank transfer, making online bill payments, basic account information and accounting check balance. The services less selected were stock trading and applying for cheque books. Lastly, the preferred method of performing banking transactions is mobile banking for around 47% of the participants. Online banking services is the first option to perform banking transaction to only 48 of the individuals.

In addition, the variables were measured through several statements, presented through the descriptive analysis tables for each construct. A test of reliability was performed to evaluate the consistency of the model. The Cronbach's Alpha value of the model is .835, suggesting very good internal consistency reliability for the scale. Also, from Table 4.2, is possible to analyse that the values of the Cronbach's Alpha if we remove any of the variable would be lower than .835, meaning that there is no reason to consider removing any of the construct from the scale.

After verifying reliability, a multiple linear regression was developed for the dependent variable, trust. Results showed that from all the constructs tested only Perceived Security (B = .447 and p = .000), Perceived Privacy (B = .295 and p = .000) and Accessibility (B = .108 and p = .047) are relevant to the model and have a direct impact on Trust, since the p value is lower than 0.05. The remaining variables, namely Usability, Quality, Computer Knowledge, Online Experience and Financial Literacy demonstrated to not impact Trust in online banking services.

The Second Statistical Test performed was an independent samples t-test with the intention of exploring customers' experience with Neobanks, banks who work without any physical branch, only from online means, which characterize the customers more involved with online banking adoption and the ones not so involved. From the results, it was possible to conclude that individuals who trust the service tend to use Neobanks, hence be more involved with the online banking world. The same test was performed in order to explore if financial literacy was relevant to the model, and the conclusion was the same as the one obtained from the linear regression analysis.

The last statistical test executed was ANOVA's test with the aim to also explore how different levels of customer trust tend to have different levels of online banking adoption. The results state that people with higher levels of trust tend to use the online channel of banks more often. The same test was execute in order to understand if customers' first choice to perform transactions was related with their level of trust. The test showed that the two highest means of trust are the ones for channels that participants prefer to perform their transactions as first choices, proving the importance of trust. Plus, it was possible to observed that Online banking is not the first choice to many of the participants to perform transactions.

To summarize, according to the descriptive statistics for the construct Trust (Table 4.9) it was possible to see that individuals still have a lot of receptiveness regarding online trust with respect to trusting the service. Plus, it can be concluded that the answer to the main research question of this thesis "Which main factors determine costumers' trust in online banking" is Perceived Security, Perceived Privacy and Accessibility.

6.2 Theoretical and Practical contributions

This dissertation was developed in the scope of the new channels provided through online means by the banking industry and the consumer perceptions about this new type of service, specifically regarding trust. Although there are numerous studies about these concepts, the subject has lack of practical studies in the Portuguese market, where the numbers of individuals embracing online banking services in lower than what it was expected. As a result, and being trust one of the factors that inhibit individuals from using online services, the purpose of this study is to provide insights into the major elements impacting customers' trust in online banking services.

As trust has such an important role in boosting the level of online banking adoption, as any other online environments or applications, and since it is beneficial for financial institutions to have customers more involved in using banks' websites to pursue their activities, the findings of this work will contribute towards a clearer and more structured understanding of the level of trust in online banking service from the Portuguese customers and the factors that determine their trust in using the channel. This dissertation provides some insights that banks might apply and improve their websites. For example, bearing in mind that the trust determinants are perceptual in nature, banks could provide appropriate advertising and marketing campaigns with visible privacy policies and the website design of the banks.

The main practical contributions of this dissertation are the clear understanding of the determinants of customers trust in online banking services. This way, banks will know which trust factors to focus on in order to increase customers' trust and thus increase online banking adoption. This research into comprehending the constructs relevant to trust will help accelerate the increase the level of adoption of online banking service by removing one of the major obstacles to its development, lack of trust.

6.3 Limitations and future research

During this investigation, the researcher discovered certain constraints that influenced the outcomes. Understanding these limitations will help future researchers to avoid such constraints and obtain better results.

The first limitation found during this work is related to the variables studied and used in the linear regression model. Not all variables that explain customers' trust in online banking services were investigated, meaning it is not possible to guarantee all the factors influencing

this indicator in banks' websites were addressed. Also, constructs were not analysed by the same number of items in the questionnaire.

A third limitation found is regarding the difficulty around collecting data through a questionnaire, since it depends on the willingness of individuals to take some time to respond.

Another identified limitation was not being able to represent Portuguese population in the most effective manner because was not possible to range all age groups in the same way. Most respondents belong to younger ages.

Regarding some topics that may be further developed in future studies and since this study only focus on gathering information about individuals using online banking services, it would be interesting to analyse the ones who do not use them and understand the reasons why and if trust is among those reasons.

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Appendices

Appendix A – Questionnaire

Section 1 – Introduction

The following questionnaire was prepared within the dissertation scope of my Master's degree in Management at ISCTE Business School. The present study aims to investigate the rate of online banking adoption and analyse customers' trust in the use of online banking services. More precisely, the research in the study focuses on factors that affect customers' trust in accepting and using online banking services.

If you have more than 18 years old and have a Portuguese bank account, please share your experience with me. Answers to the questions will remain strictly anonymous and the results will be confidential.

The questionnaire lasts for about 5 minutes. Your collaboration is much appreciated.

Thanks in advance.

Maria do Carmo Fernandes

Section 2 – Demographic questions

What is your age?

◯ 18-24 years

◯ 25-34 years

◯ 35-44 years

◯ 45-54 years

◯ 55-64 years

◯ above 64 years

What is your gender?

◯ Male

◯ Female

◯ Prefer not to say

What is your highest education qualification?

◯ No formal education

◯ Basic Education

◯ High School

◯ Bachelor

◯ Post-Graduation

◯ Master or higher

What is your current status?

◯ Student

◯ Working Student

◯ Employed Full-Time

◯ Seeking opportunities

◯ Unemployed

◯ Retired

Which of these describes your personal net monthly income?

◯ I am still studying and I do not have a source of income

◯ Less than 800 euros

◯ Between 800 and 1200 euros

◯ Between 1200 and 3000 euros

◯ More than 3000 euros

◯ Prefer not to say

Do you use online banking?

◯ Yes

◯ No

Section 3 – Questions on Online Banking adoption and usage

How long have you used online banking?

◯ Less than a year

◯ Between 1-3 years

◯ Between 4-6 years

◯ More than 6 years

How often do you use online banking (per month)?

◯ Very rarely (less than 1)

◯ Rarely (1 to 3 times)

◯ Occasionally (3 to 8 times)

◯ Frequently (8 to 12 times)

◯ Very frequently (over 12 times)

Which banking services do you use through online banking? Please check all that apply.

◯ Basic account information

◯ Accounting check balance

◯ Inter-account transfer

◯ Applying for cheque books

◯ Making online bill payments

◯ Bank transfer

◯ Stock trading

◯ Other (please specify below)

_____

Preferred methods of performing banking transactions. (Please drag the option according to your preference)

ATMs	1
Go to a bank (Branch banking)	2
Mobile banking	3
Online banking services	4

With respect to your bank's website, what is your degree of concordance with the following statements?

Answer according with the scale: (1) = strongly disagree, (2) = disagree, (3) = neutral or no opinion, (4) = agree, (5) = strongly agree.

	Strongly disagree 1	2	3	4	Strongly Agree 5
The website is easy and simple to navigate.	◯	◯	◯	◯	◯
I easily achieve my research and acquire complete information exactly to enhance my decision-making process through the website.	◯	◯	◯	◯	◯
I am satisfied with my bank's website.	◯	◯	◯	◯	◯

Have you ever used a Neobank? (Neobanks are financial institutions that do not have physical branches, and operate with or without a banking license, and independently from traditional banks. Some examples of Neobanks are revolut, N26, Monzo, and Bunq.)

◯ Yes

◯ No

Section 4 – Questions on your experience and ease with electronic devices and online world

With respect to your experience with digital devices and the Internet, what is your degree of concordance with the following statements?

Answer according with the scale: (1) = strongly disagree, (2) = disagree, (3) = neutral or no opinion, (4) = agree, (5) = strongly agree.

	Strongly disagree 1	2	3	4	Strongly Agree 5
I have a good level of computer knowledge.	◯	◯	◯	◯	◯
I feel comfortable with the online world.	◯	◯	◯	◯	◯
I have proper and direct accessibility to the Internet.	◯	◯	◯	◯	◯
I often use online means for other activities (for example, online shopping).	◯	◯	◯	◯	◯

Section 5 – Questions on financial literacy

What financial products do you own? Please check all that apply.

◯ Stocks and shares
◯ Bonds
◯ Investment Funds
◯ Insurance (life, health, multi-risk, automobile)
◯ Pension fund
◯ Mortgage
◯ Bank loan secured on property
◯ Credit card
◯ Debit card
◯ Current account
◯ Savings account

◯ Microfinance loan

◯ Other (please specify below)

With respect to your financial literacy, what is your degree of concordance with the following statements?

Answer according with the scale: (1) = strongly disagree, (2) = disagree, (3) = neutral or no opinion, (4) = agree, (5) = strongly agree.

	Strongly disagree 1	2	3	4	Strongly Agree 5
I considered several products/loans/policies/accounts from different companies before making my decision.	◯	◯	◯	◯	◯
Before I buy I carefully consider whether I can afford it.	◯	◯	◯	◯	◯
I consider having a good level of financial literacy.	◯	◯	◯	◯	◯

Section 6 – Experience with Online Banking: Perception of Security

With respect to your perception of security when working with online banking, what is your degree of concordance with the following statements?

Answer according with the scale: (1) = strongly disagree, (2) = disagree, (3) = neutral or no opinion, (4) = agree, (5) = strongly agree.

	Strongly disagree 1	2	3	4	Strongly Agree 5
Online banking has mechanisms to	◯	◯	◯	◯	◯

guarantee the safety of its users' information.					
Online banking has sufficient technical capacity to guarantee user's information cannot be changed by hackers.	○	○	○	○	○
Online banking services do not represent financial risk.	○	○	○	○	○
Making e-payments on online banking platforms is safe.	○	○	○	○	○
I feel comfortable about the security of financial transactions made through online banking.	○	○	○	○	○
I trust the security measures of my online banking services.	○	○	○	○	○

Section 6 – Experience with Online Banking: Perception of Privacy

With respect to your perception of privacy when working with online banking, what is your degree of concordance with the following statements?
Answer according with the scale: (1)= strongly disagree, (2)= disagree, (3)= neutral or no opinion, (4)= agree, (5)= strongly agree.

	Strongly disagree				Strongly Agree
	1	2	3	4	5
Online banking services stand by personal data protection law.	○	○	○	○	○
Online banking only collects users' personal data necessary for the transaction.	○	○	○	○	○
Online banking does not provide my personal information to others without my permission.	○	○	○	○	○
Online banking shows concern for the privacy of its users.	○	○	○	○	○
Online banking services have good privacy policies.	○	○	○	○	○
My personal information will not be misused.	○	○	○	○	○

Section 7 – Experience with Online Banking: Customer trust

With respect to your degree of trust when working with online banking, what is your degree of concordance with the following statements?
Answer according with the scale: (1)= strongly disagree, (2)= disagree, (3)= neutral or no opinion, (4)= agree, (5)= strongly agree.

	Strongly disagree 1	2	3	4	Strongly Agree 5
With adequate safety measures on my bank website, I do not hesitate to enter my credit card info.	○	○	○	○	○
I am prepared to give my private info for my transactions done through online banking.	○	○	○	○	○
I trust my bank on my transactions done through the website.	○	○	○	○	○
Transactions through online banking always function as expected.	○	○	○	○	○
I believe my transactions through the website are likely to be secure.	○	○	○	○	○
	○	○	○	○	○

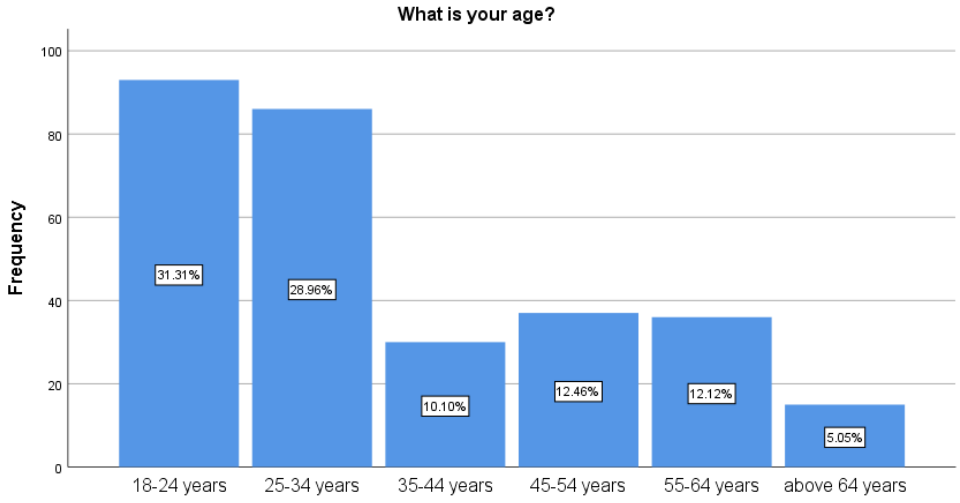
I trust the services provided through online banking.

Appendix B – Sample Profile

Frequencies of Age

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24 years	93	31.3	31.3	31.3
	25-34 years	86	29.0	29.0	60.3
	35-44 years	30	10.1	10.1	70.4
	45-54 years	37	12.5	12.5	82.8
	55-64 years	36	12.1	12.1	94.9
	above 64 years	15	5.1	5.1	100.0
	Total	297	100.0	100.0	

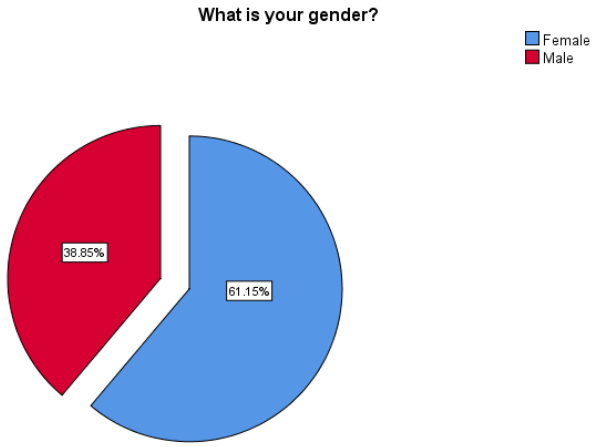


Frequencies of Gender

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	181	60.9	61.1	61.1
	Male	115	38.7	38.9	100.0
	Total	296	99.7	100.0	
Missing	System	1	.3		

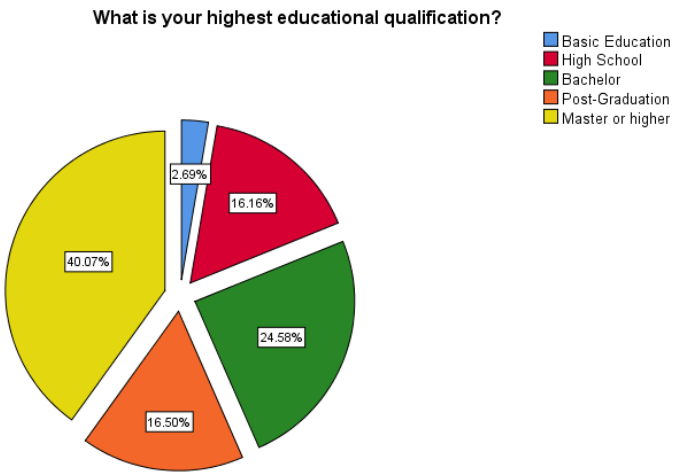
Total	297	100.0		



Frequencies of Level of Education

What is your highest educational qualification?

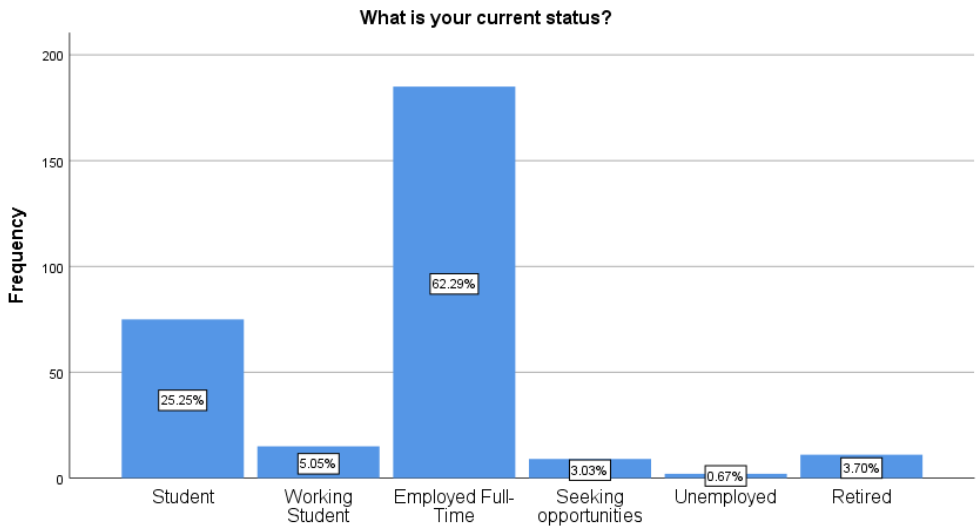
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Basic Education	8	2.7	2.7	2.7
	High School	48	16.2	16.2	18.9
	Bachelor	73	24.6	24.6	43.4
	Post-Graduation	49	16.5	16.5	59.9
	Master or higher	119	40.1	40.1	100.0
	Total	297	100.0	100.0	



Frequencies of Current Situation

What is your current status?

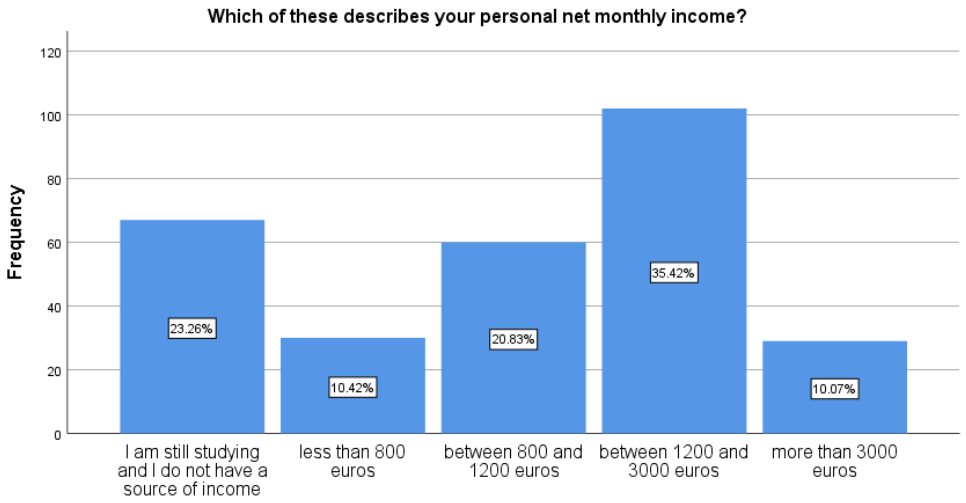
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	75	25.3	25.3	25.3
	Working Student	15	5.1	5.1	30.3
	Employed Full-Time	185	62.3	62.3	92.6
	Seeking opportunities	9	3.0	3.0	95.6
	Unemployed	2	.7	.7	96.3
	Retired	11	3.7	3.7	100.0
	Total	297	100.0	100.0	



Frequencies of monthly net income

Which of these describes your personal net monthly income?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I am still studying and I do not have a source of income	67	22.6	23.3	23.3
	Less than 800 euros	30	10.1	10.4	33.7
	Between 800 and 1200 euros	60	20.2	20.8	54.5
	Between 1200 and 3000 euros	102	34.3	35.4	89.9
	More than 3000 euros	29	9.8	10.1	100.0
	Total	288	97.0	100.0	
Missing	System	9	3.0		
Total		297	100.0		

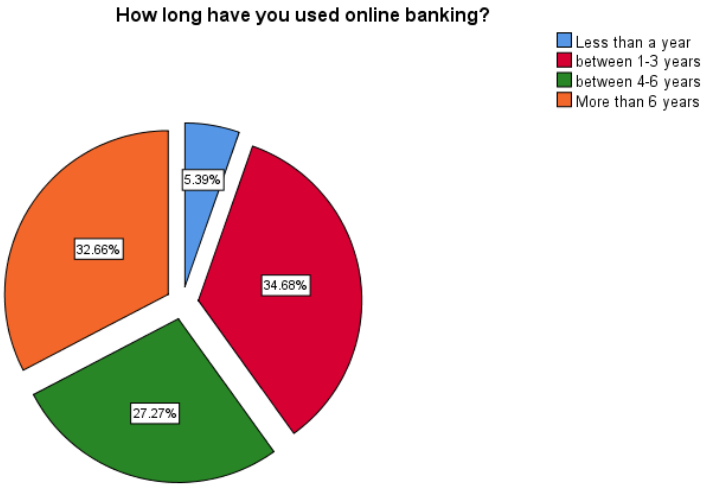


Appendix C – Online Banking Integration

Frequencies of time experience with online banking

How long have you used online banking?

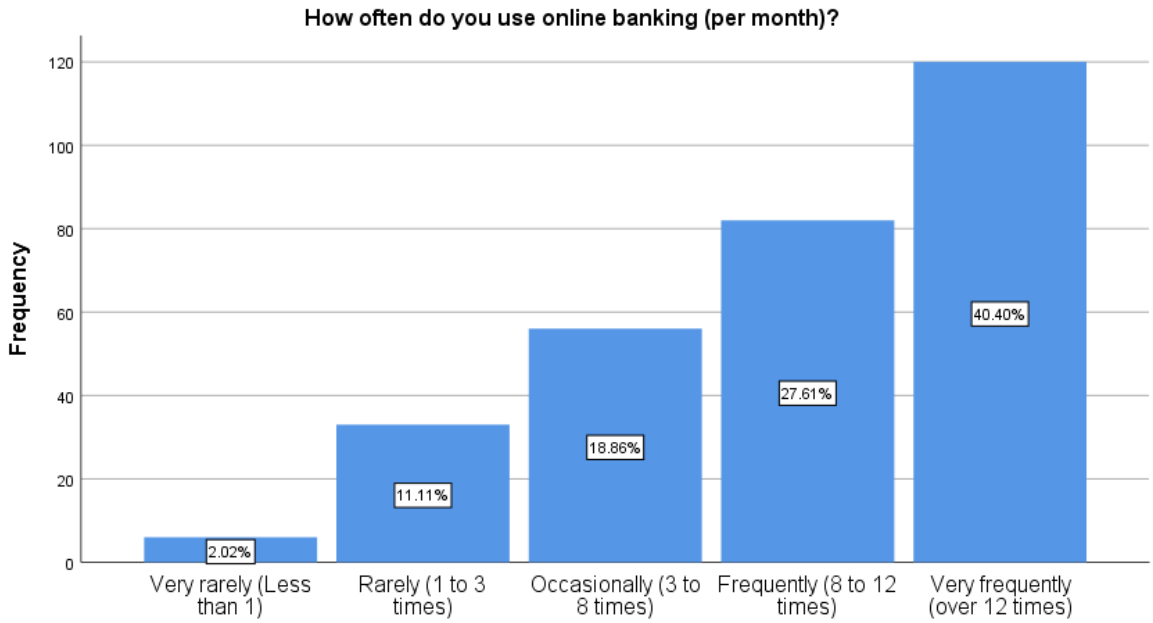
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than a year	16	5.4	5.4	5.4
	Between 1-3 years	103	34.7	34.7	40.1
	Between 4-6 years	81	27.3	27.3	67.3
	More than 6 years	97	32.7	32.7	100.0
	Total	297	100.0	100.0	



Frequencies of online banking usage (per month)

How often do you use online banking (per month)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very rarely (Less than 1)	6	2.0	2.0	2.0
	Rarely (1 to 3 times)	33	11.1	11.1	13.1
	Occasionally (3 to 8 times)	56	18.9	18.9	32.0
	Frequently (8 to 12 times)	82	27.6	27.6	59.6
	Very frequently (over 12 times)	120	40.4	40.4	100.0
	Total	297	100.0	100.0	



Appendix D – Descriptive Statistics

Descriptive Statistics of Perceived Security

Descriptive Statistics

	N	Mean	Std. Deviation
Online banking services stand by personal data protection law.	297	3.73	.843
Online banking only collects users' personal data necessary for the transaction.	297	3.43	.921
Online banking does not provide my personal information to others without my permission.	297	3.55	.996
Online banking shows concern for the privacy of its users.	297	3.70	.891
Online banking services have good privacy policies.	297	3.63	.856
My personal information will not be misused.	297	3.47	.885
Valid N (listwise)	297		

Descriptive Statistics of Perceived Privacy

Descriptive Statistics

	N	Mean	Std. Deviation
Online banking services stand by personal data protection law.	297	3.73	.843
Online banking only collects users' personal data necessary for the transaction.	297	3.43	.921
Online banking does not provide my personal information to others without my permission.	297	3.55	.996
Online banking shows concern for the privacy of its users.	297	3.70	.891
Online banking services have good privacy policies.	297	3.63	.856
My personal information will not be misused.	297	3.47	.885
Valid N (listwise)	297		

Descriptive Statistics of Quality and Usability

Descriptive Statistics

	N	Mean	Std. Deviation
The website is easy and simple to navigate.	297	4.08	.941
I easily achieve my research and acquire complete information exactly to enhance my decision-making process through the website.	297	3.86	.969
I am satisfied with my bank's website.	297	4.01	.856
Valid N (listwise)	297		

Descriptive Statistics of Accessibility, Computer and Online Experience

Descriptive Statistics

	N	Mean	Std. Deviation
I have a good level of computer knowledge.	297	4.10	.932
I feel comfortable with the online world.	297	4.16	.900
I have proper and direct accessibility to a computer and to the Internet.	297	4.55	.770
I often use online means for other activities (for example, online shopping),	297	4.27	.994
Valid N (listwise)	297		

Descriptive Statistics of Financial Literacy

Descriptive Statistics

	N	Mean	Std. Deviation
I considered several products/loans/policies/accounts from different companies before making my decision.	297	3.49	1.109
Before I buy I carefully consider whether I can afford it.	297	4.25	.899
I consider having a good level of financial literacy.	297	3.51	.987
Valid N (listwise)	297		

Descriptive Statistics of Trust

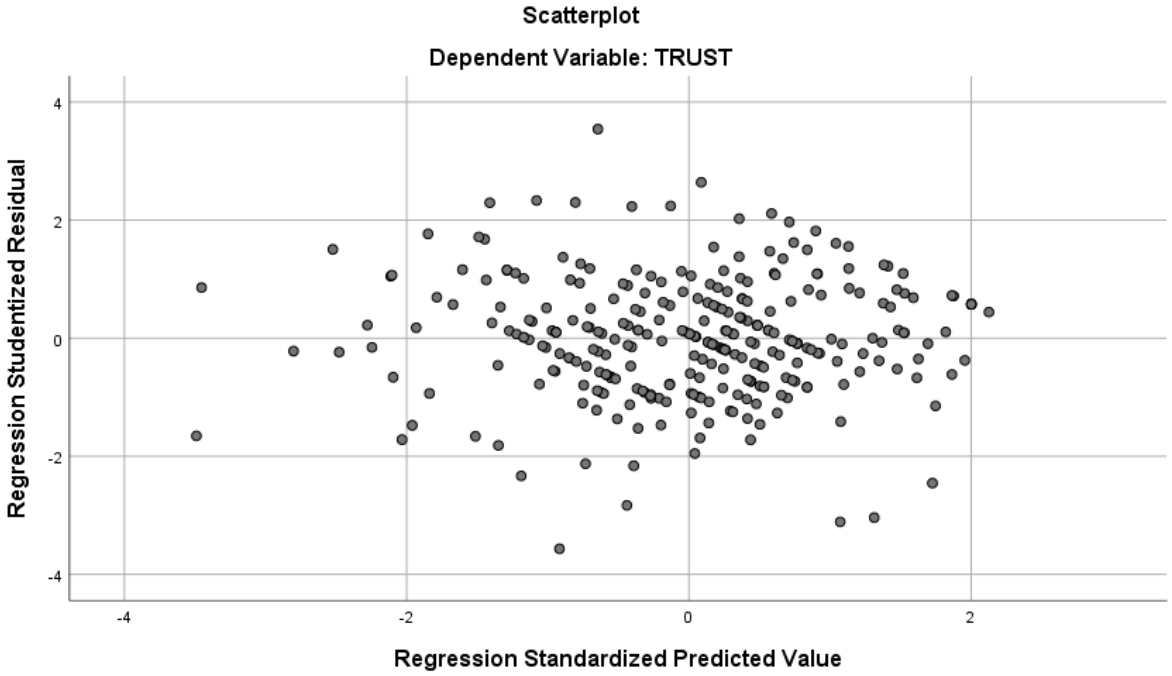
Descriptive Statistics

	N	Mean	Std. Deviation
With adequate safety measures on my bank website, I do not hesitate to enter my credit card info.	297	3.41	1.029
I am prepared to give my private info for my transactions done through online banking.	297	3.28	.987
I trust my bank on my transactions done through the website.	297	3.79	.859
Transactions through online banking always function as expected.	297	3.64	.905
I believe my transactions through the website are likely to be secure.	297	3.80	.860
I trust the services provided through online banking.	297	3.83	.802
Valid N (listwise)	297		

Appendix E – Regression analysis results

Linear Regression assumptions

a. Assumptions regarding Linearity in the relationship between variables



Correlations

		USAB	QUAL	COMPEXP	ACCES	ONLEXP	FL	PSEC	PPRIV	TRUST
USAB	Pearson Correlation	1	.812**	.242**	.328**	.281**	.265**	.410**	.354**	.351**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000
	N	297	297	297	297	297	297	297	297	297
QUAL	Pearson Correlation	.812**	1	.202**	.325**	.280**	.241**	.356**	.352**	.313**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000
	N	297	297	297	297	297	297	297	297	297
COMPEXP	Pearson Correlation	.242**	.202**	1	.573**	.747**	.280**	.367**	.265**	.303**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000
	N	297	297	297	297	297	297	297	297	297
ACCES	Pearson Correlation	.328**	.325**	.573**	1	.672**	.332**	.404**	.375**	.420**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000
	N	297	297	297	297	297	297	297	297	297
ONLEXP	Pearson Correlation	.281**	.280**	.747**	.672**	1	.337**	.449**	.354**	.418**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000
	N	297	297	297	297	297	297	297	297	297
FL	Pearson Correlation	.265**	.241**	.280**	.332**	.337**	1	.412**	.317**	.272**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000
	N	297	297	297	297	297	297	297	297	297
PSEC	Pearson Correlation	.410**	.356**	.367**	.404**	.449**	.412**	1	.648**	.674**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000
	N	297	297	297	297	297	297	297	297	297
PPRIV	Pearson Correlation	.354**	.352**	.265**	.375**	.354**	.317**	.648**	1	.630**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000
	N	297	297	297	297	297	297	297	297	297
TRUST	Pearson Correlation	.351**	.313**	.303**	.420**	.418**	.272**	.674**	.630**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
	N	297	297	297	297	297	297	297	297	297

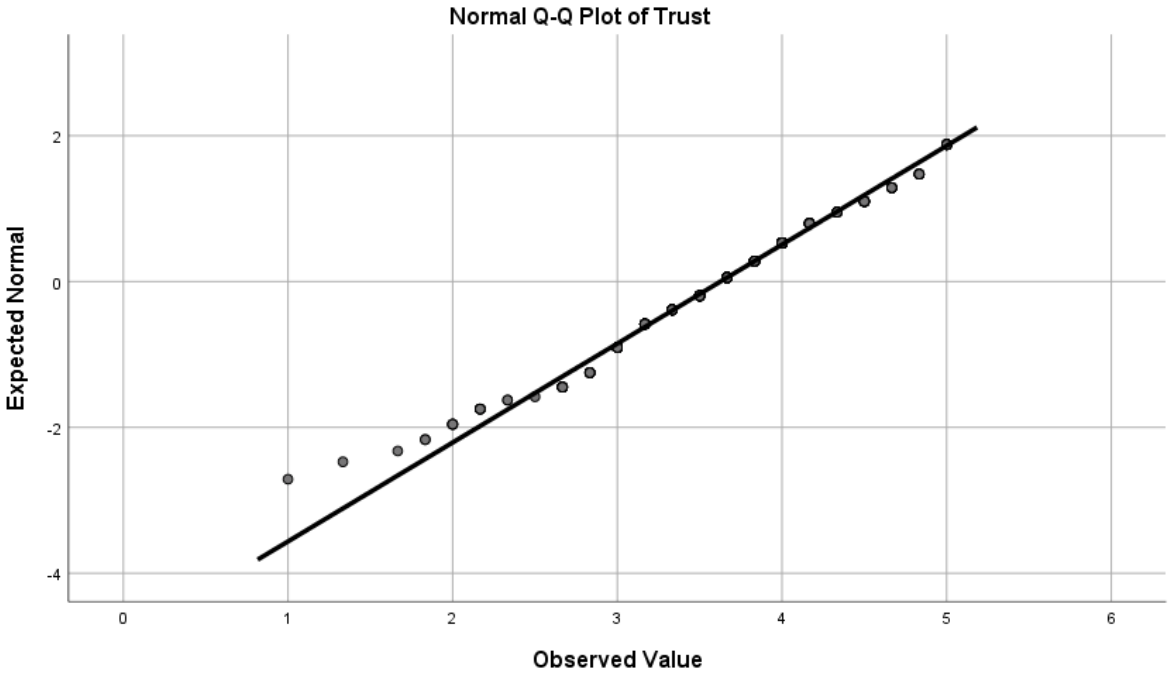
**. Correlation is significant at the 0.01 level (2-tailed).

b. Assumptions regarding Residuals/Erros

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TRUST	.076	297	.000	.977	297	.000

a. Lilliefors Significance Correction



Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.73	4.78	3.63	.542	297
Residual	-1.796	1.723	.000	.499	297
Std. Residual	-3.549	3.404	.000	.986	297
Stud. Residual	-3.567	3.542	.000	1.006	297

a. Dependent Variable: Trust

Linear Regression Model Summary and Validity

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.736[a]	.541	.529	.506	2.084

a. Predictors: (Constant), USAB, QUAL, COMPEXP, ONLEXP, ACCES, FL, PSEC, PPRIV

b. Dependent Variable: TRUST

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	87.065	8	10.883	42.488	.000[b]
	Residual	73.769	288	.256		
	Total	160.834	296			

a. Dependent Variable: TRUST

b. Predictors: (Constant), USAB, QUAL, COMPEXP, ONLEXP, ACCES, FL, PSEC, PPRIV

Model's coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.412	.217		1.898	.059	-.015	.840					
	QUAL	-.029	.060	-.034	-.491	.624	-.147	.088	.313	-.029	-.020	.330	3.028
	USAB	.054	.059	.064	.911	.363	-.063	.171	.351	.054	.036	.320	3.122
	COMPEXP	-.056	.048	-.070	-1.150	.251	-.151	.039	.303	-.068	-.046	.428	2.338
	ACCES	.108	.054	.112	1.991	.047	.001	.214	.420	.117	.079	.499	2.002
	ONLEXP	.096	.059	.112	1.623	.106	-.020	.212	.418	.095	.065	.337	2.970
	FL	-.055	.041	-.060	-1.326	.186	-.136	.026	.272	-.078	-.053	.786	1.273
	PSEC	.447	.062	.417	7.223	.000	.325	.569	.674	.392	.288	.478	2.092
	PPRIV	.295	.052	.305	5.674	.000	.192	.397	.630	.317	.226	.551	1.814

a. Dependent Variable: TRUST

Appendix F – Independent samples t-test results

Independent samples t-test (Shares and Stocks)

Group Statistics

	Stocks and shares	N	Mean	Std. Deviation	Std. Error Mean
TRUST	Yes	250	3.61	.736	.047
	No	47	3.72	.743	.108

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TRUST	Equal variances assumed	.021	.885	-.907	295	.365	-.106	.117	-.337	.124
	Equal variances not assumed			-.901	64.159	.371	-.106	.118	-.342	.129

Independent samples t-test (Neobanks)

Group Statistics

	Have you ever used a neobank?	N	Mean	Std. Deviation	Std. Error Mean
TRUST	Yes	199	3.53	.749	.053
	No	98	3.81	.678	.068

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TRUST	Equal variances assumed	.407	.524	-3.127	295	.002	-.280	.090	-.457	-.104
	Equal variances not assumed			-3.235	211.377	.001	-.280	.087	-.451	-.109

Appendix G – ANOVA test

ANOVA test (preferred channel to perform transactions)

Descriptives

TRUST

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Online banking	48	3.32	.807	.117	3.08	3.55	1	5
Mobile banking	139	3.72	.707	.060	3.60	3.84	1	5
ATM	92	3.66	.734	.077	3.51	3.81	2	5
Go to a bank	18	3.56	.597	.141	3.26	3.85	3	5
Total	297	3.63	.737	.043	3.54	3.71	1	5

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
TRUST	Based on Mean	.633	3	293	.594
	Based on Median	.605	3	293	.612
	Based on Median and with adjusted df	.605	3	281.151	.612
	Based on trimmed mean	.646	3	293	.586

ANOVA

TRUST

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.103	3	2.034	3.852	.010
Within Groups	154.731	293	.528		
Total	160.834	296			

ANOVA test (frequency of online banking services usage per month)

Descriptives

TRUST

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Very rarely (Less than 1)	6	2.94	.697	.284	2.21	3.68	2	4
Rarely (1 to 3 times)	33	3.39	.798	.139	3.11	3.67	2	5
Occasionally (3 to 8 times)	56	3.48	.731	.098	3.28	3.67	1	5
Frequently (8 to 12 times)	82	3.58	.684	.076	3.43	3.73	2	5
Very frequently (over 12 times)	120	3.83	.709	.065	3.70	3.96	2	5
Total	297	3.63	.737	.043	3.54	3.71	1	5

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
TRUST	Based on Mean	.399	4	292	.809
	Based on Median	.375	4	292	.826
	Based on Median and with adjusted df	.375	4	280.652	.826
	Based on trimmed mean	.401	4	292	.808

ANOVA

TRUST

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.031	4	2.758	5.376	.000
Within Groups	149.803	292	.513		
Total	160.834	296			