



Consumer Acceptance of the Usage of Artificial Intelligence in the Banking Sector

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ABSTRACT

Title: Consumer Acceptance of the Usage of Artificial Intelligence in The Banking Sector

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In the past years, artificial intelligence (AI) technologies have become rapidly integrated into the banking sector, thus understanding the factors that influence customers to accept the usage of these innovations is crucial for financial institutions. AI offers huge transformative potential, as it can enhance operational efficiency, improve consumer service, or strengthen security. However, there is limited research on how consumers perceive and adopt these technologies, especially from a customer experience (CX) perspective. This gap in understanding presents a challenge for banks that are trying to fully leverage AI in their customer-facing services.

This study aims to investigate the key factors that are influencing consumer acceptance of AI technologies in banking, with a focus on awareness, trust in electronic security, customer experience, and demographic factors, specifically age. The results revealed that the most significant driver for adoption is the perceived trust towards electronic security. Age also has a huge influence, as younger customers appeared to be more inclined to embrace AI services compared to older generations. Contrary to expectations, neither customers' awareness of using AI technologies nor customer experience had a statistically significant impact on AI acceptance.

Keywords: Digital Transformation; Artificial Intelligence (AI); Customer Experience (CX); AI-enabled customer experience; Financial services; Customer perception; AI Adoption; FinTech

SUMÁRIO

Título: Aceitação pelo Consumidor da Utilização da Inteligência Artificial no Setor Bancário

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Nos últimos anos, as tecnologias de inteligência artificial (IA) foram rapidamente integradas no sector bancário, pelo que compreender os fatores que influenciam os clientes a aceitar a utilização destas inovações é crucial para as instituições financeiras. A IA oferece um enorme potencial de transformação, uma vez que pode aumentar a eficiência operacional, melhorar o serviço ao consumidor ou reforçar a segurança. No entanto, existe pouca investigação sobre a forma como os consumidores percebem e adaptam estas tecnologias, especialmente numa perspetiva de experiência do cliente (CX). Esta lacuna na compreensão representa um desafio para os bancos que estão a tentar tirar o máximo partido da IA nos seus serviços virados para o cliente.

Este estudo visa investigar os principais fatores que influenciam a aceitação pelo consumidor das tecnologias de IA no sector bancário, com destaque para a sensibilização, a confiança na segurança eletrónica, a experiência do cliente e os fatores demográficos, especificamente a idade. Os resultados revelaram que o fator mais significativo para a adoção é a confiança percebida em relação à segurança eletrónica. A idade também tem uma grande influência, uma vez que os clientes mais jovens parecem estar mais inclinados a adotar os serviços de IA do que as gerações mais velhas. Contrariamente às expectativas, nem a sensibilização dos clientes para a utilização de tecnologias de IA nem a experiência do cliente tiveram um impacto estatisticamente significativo na aceitação da IA.

Palavras-chave: Transformação digital; Inteligência Artificial (IA); Experiência do cliente (CX); Experiência do cliente com IA; Serviços financeiros; Perceção do cliente; Adoção da IA; FinTech

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
CX	Customer Experience
ML	Machine learning
NLP	Natural Language Processing
UI	User Interface
IoT	Internet of Things
UX	User Experience

1. INTRODUCTION

Our daily lives are increasingly pervaded by technology; we encounter it in almost every field, and the business world is no exception. Digitalization and innovation have become essential for all organizations. Various modern technologies are driving revolutionary changes, disrupting industries, and creating new business models.

Artificial intelligence (AI) is one of the most popular topics nowadays, we can read numerous studies and research about its ability to complement and enhance human abilities. I find it extremely fascinating how far this technology can evolve, as it is already widespread in multiple industries. The countless articles and studies written about the potential of AI strongly suggest the significance of the technology.

The recent rise of AI technology has reached the banking sector as well. The sector is going through a rapid digital transformation, which is enhanced by the adoption of AI-enabled technologies. This level of automation offers great potential to revolutionize banking by enhancing operational efficiency, improving customer service, and strengthening security measures (X. Chen et al., 2021; Jarek & Mazurek, 2019). However, it is crucial to understand the underlying factors of the growing integration of AI: Some questions and theories are still a critical area of study; understanding the causes that influence consumer acceptance of these technologies is one of these areas.

Reviewing previous literature shows, that the main topic of research on AI in banking is mainly centered around the operational benefits and technological advancements, with a limited focus on customer experience (CX). Many studies have highlighted the technical and security aspects of AI in banking (Hamzah et al., 2017; Szikora & Nagy, 2020), and how it is implemented into the organizational and strategic level of operation.

This study aims to contribute to the ongoing scholarly discussion surrounding digital transformation and customer engagement in the financial services industry by evaluating existing knowledge and integrating new findings into less-researched areas.

The research is guided by the following question: “What factors influence consumer acceptance of AI technologies in the banking sector?” The study is focused on examining key variables, such as consumers’ awareness of AI usage, their perceived trust in electronic security, customer

experience, and demographic factors – particularly age – to determine their roles in shaping the users' AI acceptance.

As a management student, I am particularly interested in the development of organizations, their processes and strategies. Since digitalization is now an integral part of these developments, my goal was to gain a deeper insight into a certain technology and its effect. Moreover, I am motivated to research the topic, as my professional experience in working with customer-facing AI products showed me how diverse this area is, and how nuanced things can influence customers' experience with different technologies and automated surfaces. As AI continues to reshape the industry, it is crucial to understand its impact on customer interactions.

2. LITERATURE REVIEW

This section of the dissertation provides a literature review of current and pertinent topics related to artificial intelligence in the banking industry. Its purpose is to inform and direct the development of new research. This study will present definitions and explanations of relevant theories and frameworks related to AI, banking, and the implementation of AI in various domains. It will also address the challenges associated with AI implementation and the impact on the customer experience. The objective is to offer a comprehensive understanding of the existing literature in this research field. This section entails a meticulous examination and integration of the relevant literature to pinpoint areas with a research gap and where inconsistencies exist. It also aims to place this research into the larger framework of the field of study to showcase its importance.

To write the literature review multiple papers were used, with varying topics and resources. The main source of information was Google Scholar, where the researched keywords were centered around the following: AI in the banking sector, customer acceptance of AI technologies, digital transformation in the banking sector, and AI-enabled customer experience. Moreover, books and publications from former university studies were used, as well as industry reports, to ensure that the research is up to date with the latest trends.

2.1 Digital transformation

Digital transformation has become a critical topic in recent years due to its potential to revolutionize businesses by integrating new digital technologies. It involves incorporating Information and Communication Technologies (ICT) into various aspects of organizations, leading to significant improvements in customer experience, operational efficiency, and the creation of innovative business models (Warner & Wäger, 2019). Digital transformation is a prominent issue in current literature, mostly centered around the organizational context and its function as a catalyst for significant changes within entities, owing to the extensive impact of digital technology on organizational structures and processes. The concept encompasses the role of digital technologies such as mobile, social media, artificial intelligence, cloud computing, blockchain, and the Internet of Things (IoT) in driving substantial enhancements in different business functions and organizational transformation (Balakrishnan & Das, 2020). The significance of digital transformation is present across different industries, emphasizing its role in facilitating strategy revitalization and fostering adaptable skills within businesses. (Warner & Wäger, 2019). The integration of these innovations is considered a driver for

changes in the business world, with profound implications for society as a whole (Rachinger et al., 2019).

Within the realm of international business, the process of digital transformation is of utmost importance to effectively incorporate technological tools into business operations and strategies, despite the challenges associated with embracing novel technologies (Pereira et al., 2022). Digital transformation encompasses more than simply a mere shift in technology; it signifies a profound alteration in the way companies function, interact with consumers and generate value. The concept incorporates multiple aspects, such as technology and actor dynamics, that are essential for comprehending its impact on business strategy and operations (Nadkarni & Prügl, 2021).

2.1.1. Artificial Intelligence

This section of the literature review focuses on discussing the topic of artificial intelligence (AI), as the purpose of the thesis is to investigate AI as a tool used in the banking environment. The chapter will begin with a clarification of the concept of AI, and then move on to the different types and sub-areas of the technology.

Artificial intelligence is derived from the field of information technology. It is frequently employed synonymously with concepts such as automation or robotization. Sometimes AI is mistaken for machine learning (ML) or algorithm application, making it challenging to provide a precise definition (Jarek & Mazurek, 2019). In academic circles AI is most commonly defined as systems that mimic cognitive functions generally associated with human attributes such as learning, speech and problem solving (Collins et al., 2021; Russell, S., & Norvig, 2016). AI has been integrated into many work processes in which the amount of data greatly surpasses the ability of humans to analyze, understand, and make choices utilizing extensive databases (Tulcanaza-Prieto et al., 2023).

AI encompasses a wide range of technologies that simulate human intelligence in various ways. Currently, there is no standardized method in the literature for classifying the many categories and sub-areas, as AI is a multifaceted term that encompasses several possible meanings (European Banking Federation, 2019). AI technologies are often interlinked or even build on each other. This study will present both categories that can be regarded as autonomous technologies (e.g. machine learning) and categories that extend the aforementioned technologies (e.g. chatbots, which further develop machine learning and natural language processing). As the objective of this paragraph is to outline the categories that are considered

most relevant to the subject of banking applications, the sub-chapter lacks a comprehensive overview of the many types of AI, for instance, it does not cover expert systems or humanoid robots.

Machine learning is a core subset of AI, and its objective is to detect patterns in the existing data and provide predictions with utmost precision using a broad range of algorithms (Sarker, 2021). The determinant of success is the model's ability to make predictions with maximum accuracy beyond the established prediction pattern (Muraközy, 2018). After the learning phases, as data and experience grow, the system becomes more accurate in predicting and performing its tasks (Nichols et al., 2019). Natural Language Processing (NLP) is another crucial field that allows machines to comprehend, interpret, and produce human language. It is commonly linked to Automatic Speech Recognition and Text to Speech technologies. Speech recognition technology enables the transformation of spoken language into written text, hence improving user engagement with many gadgets and applications (European Banking Federation, 2019). Text and data mining methods are used to extract significant patterns and insights from extensive databases, therefore enabling decision-making processes in many fields (Talib et al., 2016). Finally, chatbots exemplify a pragmatic implementation of artificial intelligence, employing NLP and ML to replicate conversations that resemble those with humans, hence enhancing user involvement and service effectiveness (Doherty & Curran, 2019).

2.2. Overview of the banking industry

To understand how customers perceive new technologies implemented by commercial banks, it is necessary to analyze the banking sector and its response to digital transformation. Establishing and accurately describing the key players within the banking sector can highlight the importance and effects of digital transformation in the industry. Traditional banks, digital banks, and non-bank financial institutions all play significant roles, with the latter two increasingly challenging the dominance of traditional banks, even in the absence of banking licenses (X. Chen et al., 2021).

2.2.1. Definitions in the industry

The economy is a complex system, within which the world of money is a clearly distinguishable area (Vigyári, 2017). According to Vigvári (2017), the reality of the financial world is described by the concept of the financial system. The role of the financial system has increased as economies have become more money centered. Gál in 2010 referred to the financial sector as

“the most important and largest service sector in the world economy” (Gál, 2010). Today, the largest banks have international operations and are involved in globalized capital and financial flows. The financial intermediation system can also be seen as the engine of the market economy, based on empirical evidence from several studies (Katona, 2018).

The rapid advancement of technology in the financial industry, particularly through the emergence of fintech firms, has significantly complicated the traditional definitions and roles of banks (Hendrikse et al., 2018) – fintech refers to a broad range of digital innovations and technology-enabled business models that disrupt existing financial structures and blur the lines between traditional banking and new financial services (Philippon, 2019).

This thesis is using classifications for traditional banks, digital banks and financial institutions that are challenging traditional banks without holding a banking license, referring to existing literature.

Traditional banks, often referred to as commercial banks, are financial institutions primarily engaged in accepting deposits from the public and providing loans to individuals and businesses (Mullineux, 2012). Considering the fundamental operation of banking institutions, we can see, that often their business method is rooted in the interest rate spread, which is the difference between the rates they charge on loans and the rates they pay on deposits. This spread is crucial for banks as it directly influences their profitability and operational strategy (Ho & Saunders, 1981). The conventional banking model is distinguished by its emphasis on direct customer engagement, a physical branch network, and a variety of services such as checking and savings accounts, personal loans, and mortgages (Mehdiabadi et al., 2020; Mullineux, 2012). The primary roles of conventional banks encompass the allocation of savings, extension of credit, and facilitation of payment mechanisms. These financial institutions play a vital role in the economy by serving as intermediaries between savers and borrowers, thereby making significant contributions to the stability of the financial system and the growth of the economy (Young, 2019). Additionally, it is important to note, that traditional banks are subject to regulatory supervision, which aims to safeguard depositors and uphold the integrity of the financial system. This supervision encompasses necessary provisions for capital reserves and strict compliance with banking regulations that govern their activities (Mullineux, 2012).

To define digital banks, it is crucial to see the evolution of banking services in the digital era. Digital banking – or online banking or electronic banking – involves conducting transactions

and accessing account information electronically through various devices like smartphones or personal computers (Shaikh et al., 2017). Digital banking represents a significant transformation in the banking sector, offering customers the convenience of remote financial transactions and access to services through digital channels. The adoption of digital banking is not only about enhancing customer experience but also about improving financial performance and loyalty (Mbama & Ezepeue, 2018).

Last, but not least, it is important to characterize those financial institutions that are challenging traditional banks without a banking license and the concept of shadow banking.

It is important to note that there are multiple entities, which do not hold a banking license and challenge traditional banks as well, for instance payment institutions, e-money institutions, or peer-to-peer lending factors (Buchak et al., 2018). However, this thesis will portray the concept of shadow banking, as they operate on a much larger scale compared to many other non-traditional institutions (Gennaioli et al., 2013).

Shadow banking refers to a system of credit intermediation involving entities and activities outside the regular banking system. These entities operate similarly to banks but are not subject to the same regulations. They can include investment funds, money market funds, and other non-bank financial institutions (Pozsar et al., 2010).

2.3. The Evolution of Banking: Digital Transformation and Industry Trends

This chapter aims to comprehend and evaluate the primary trends in the banking sector. Among the several trends in the industry identified in research studies, four current and significant trends will be outlined that are relevant for the topic of this thesis. The trends explored in the subsequent subsections are closely interconnected and interrelated: ever-increasing industry competition, a focus on customer experience, technological innovation, and a demographic shift.

2.3.1. Increasing industry competition

Within the financial sector, commercial banks are encountering escalating rivalry, which is further intensified by the intrinsic risk aversion that defines their operations (Berger et al., 2009). This risk aversion is an inherent characteristic of conventional financial organizations since they give priority to stability and adherence to regulations rather than pursuing ambitious innovation plans (Berger et al., 2009). As a result, it's been a big challenge for these banks to innovate and stay competitive (Tan, 2016). Regulatory frameworks further exacerbate this

situation by imposing constraints that limit the flexibility and speed at which banks can adapt to market changes and technological advancements (Kang et al., 2023). For a long time, new entrants have found it difficult to break into the financial services industry. Large, long-standing financial institutions, known as "incumbents", had a competitive edge due to their large size, extensive network, and advanced systems. Nevertheless, PWC research conducted in 2016 has shown that this is no longer true, as emerging competitors are displaying greater audacity (PwC, 2016). Today, banks must therefore compete not only with other incumbent banks but also with the above-mentioned digital banks and unlicensed challengers. Moreover, the growing trend of "embedded finance", which entails the incorporation of a financial service or product within a conventionally non-financial service (for instance Uber's in-app payment system), presents an additional formidable obstacle (McKee, 2020). The rapid expansion of these challenger entities in the market is exemplified by the rise of fintech companies, with investment in these firms reaching to \$229 billion globally in 2021 (Statista, 2024).

From the outset, fintech and tech firms, adopt a customer-centric approach and strategy. This orientation drives them to prioritize innovation, consistently test, fail quickly, and adapt quickly. Consequently, they promptly address client feedback, which is a crucial part of their success (Infosys Knowledge Institute, 2020). These firms derive significant advantages from the absence of outdated systems, as it enables them to allocate resources towards cutting-edge technology and enhancing customer experience, rather than solely focusing on modernizing current systems (EY, 2020). This enables them to undergo rapid evolution and provide services to clients at a relatively lower cost (Horváth, 2020). As customers' trust in fintech and tech firms grows, banks are at risk of losing primary customer relationships (McKinsey, 2020a). Therefore, incumbent banks are compelled to reconsider their strategy and business model in a shifting industrial environment marked by progressively fierce competition (BCG, 2020).

Ultimately, it is evident that innovation and adaptation play a crucial role in response to the escalating competition prevailing in the banking industry. The rise of fintech and tech companies, characterized by their agility, customer-centric strategies, and lack of legacy constraints, presents a formidable challenge to traditional banks. As these players continue to disrupt the market with innovative solutions and superior customer experiences, incumbent banks must reconsider their strategies and embrace emerging technologies like artificial intelligence (Husain et al., 2022). This shift is not merely about staying competitive; it is about redefining the core of banking services in an era where consumer expectations are rapidly evolving (Husain et al., 2022; Philippon, 2019). Understanding these dynamics is essential for

analyzing how AI can be effectively integrated into banking to meet the growing demands of consumers and maintain trust in the face of relentless industry transformation.

2.3.2. Focus on customer experience

In the realm of banking services, Customer Experience (CX), User Experience (UX) and the User Interface (UI) play pivotal roles in shaping customer perceptions and interactions with digital platforms. CX, UX and UI are essential components not just in the design, but in the whole delivery of the banks' services, as CX includes all interactions across various touchpoints, representing the overall experience a customer has with a company. UX focuses on the user's feelings and attitudes during system interactions, emphasizing ease of use and satisfaction. UI, on the other hand, concentrates on the visual and interactive aspects of a product, striving to create a seamless and visually appealing interface for users (Ubam et al., 2021).

The evolving landscape in the banking sector highlights the importance of a market-oriented model that prioritizes customer-centric strategies over mere operational efficiency (Haapio et al., 2019). This shift reflects the growing recognition that customer orientation significantly influences how financial services meet client needs, with a strong focus on customer experience becoming a key driver of brand perception (Northey et al., 2022).

According to a study published by EY (EY, 2020), banks that consistently prioritize the customer are the ones who truly distinguish themselves from their competitors. These financial institutions prioritize the development of high-quality and pertinent services, and rather than selling through conventional markets and sales, they build well-defined target groups. A continuous research effort is undertaken to develop products and services that more effectively cater to customer demands. The imperative for banks to prioritize the customer arises from two primary factors: evolving customer expectations and demands, and the emergence of new competitors that facilitate the provision of desired client experiences (Tedjokusumo & Murhadi, 2023).

Considering the higher expenses and challenges associated with acquiring a new client compared to retaining an existing one (Neely, 2002), literature suggests that banks prioritize the improvement of customer experience (Mbama & Ezepue, 2018; Tedjokusumo & Murhadi, 2023). Certain elements are progressively becoming indispensable for banks to establish the optimal customer experience. Research indicates that factors such as trust, flow experience, perceived usefulness, and UI design play a significant role in influencing the adoption of fintech

services among bank users (Zhongqing et al., 2019). Another important element is digital innovation, which has become indispensable in the banking industry to establish expedited and streamlined procedures for clients (Tedjokusumo & Murhadi, 2023) - subsection 2.3.3. provides a comprehensive analysis of digitalization as a prominent industry trend. Mbama & Ezepue (2018) delve into the relationship between digital banking, customer experience, and bank financial performance, showing the importance of different interfaces and choices offered to customers. Looking through a customer-centric lens, it emphasizes the need for seamless user experiences across various digital channels.

As previously said, according to Zhongqing et al. (2019), trust also plays a pivotal role in the banking industry, serving as a cornerstone for customer relationships and overall financial stability. The impact of trustworthiness on customer satisfaction and loyalty is substantial, as shown by the strong correlation between perceived service quality and consumer trust in banking settings (Hamzah et al., 2017). Trust is not merely a byproduct of excellent service; it is a critical element that enables consumer engagement and reduces the perceived risks associated with financial transactions (Roberts-Lombard & Petzer, 2021).

2.3.3. Technological innovation and digitalization

Over the past two decades, the megatrend of digitalization has penetrated almost every aspect of our lives and the economy. The financial services industry has seen dramatic, technology-driven changes in recent years. Technological innovations have played a key role in increasing the economic value of services and customer satisfaction (Ransbotham et al., 2017). Traditional banks need to rethink their strategy and business model in a changing industry environment (BCG, 2019). These institutions have no choice but to modernize, as the pressure is compounded by increasing industry competition and the changes in customer behavior and expectations (Ransbotham et al., 2017).

Several new technologies have acquired a foothold in commercial banking in recent years, with RPA, cloud services, and APIs being the most significant (McKinsey, 2020b). Moreover, the sector has been significantly disrupted by the emergence of artificial intelligence, which is now being implemented by numerous institutions (World Economic Forum, 2018). The potential applications of AI in the banking sector are discussed in more detail in Chapter 2.4.

In the past years, companies are laying a huge emphasis on digitalization. Already in 2018, according to research by EY, 85% of financial institutions already considered digitalization a top priority (EY, 2018). Nevertheless, the sector indicates a more optimistic outlook regarding

the digitalization of internal operations; however, there are numerous areas in which the digitalization of relationships with external stakeholders must be enhanced. Organizations have demonstrated that internal digitalization within banks improves operational efficiency and audit practices by integrating new technologies into their internal processes (Betti et al., 2021).

However, the situation is less advantageous when it comes to interactions with external stakeholders. Banks are increasingly acknowledging the significance of establishing partnerships with fintech companies to improve their market presence and consumer engagement (Hornuf et al., 2020). Despite this recognition, there is still a substantial gap in the digitalization of customer relations, as numerous banks are unable to completely harness digital tools for effective communication and service delivery to their clients (Carbó-Valverde et al., 2024).

2.3.4. Demographic shifts in the banking sector

Banks may leverage digital transformation to effectively target and interact with untapped market segments. In 2022, the GSMA reported that the worldwide smartphone penetration stood at 67% (GSMA, 2022). By 2026, Insider's 2023 research predicts that the market share for Generation Z (born between 1997 and 2013) mobile phones would reach 96.9%, indicating a nearly saturated market (Brown, 2023). Between now and 2026 an estimated 4 million individuals in their teens and twenties are projected to establish a bank account annually. This also indicates a substantial growth in the number of mobile and digital banking service users. Per the same study, the mobile banking user base in this age bracket is projected to surpass that of Generation X (born between 1965 and 1980) by the year 2025 (Brown, 2023).

Furthermore, it is evident that the mobile and digital banking services offered by a certain bank are seen by young individuals as a key determinant in their selection of a bank, surpassing relevance for other age cohorts. Moreover, they tend to switch their underperforming bank in the realm of digital advancement (MNB, 2022).

2.4. AI in the banking industry

Artificial intelligence, as previously mentioned, is also playing an increasingly important role in the financial sector (Northey et al., 2022). This chapter will explore the correlation between the banking industry and AI, based on the existing literature.

Digital transformation is a widespread phenomenon that affects nearly every aspect of our life. Within the realm of business, digital transformation is not only enhancing efficiency and

effectiveness, but also presenting prospects for the generation of more value (Reddy & Reinartz, 2017). Péter Móricz (2019) presented the 'five pillars of digitization' paradigm. According to this model, there are five categories of digitalization: digitalization of business models, products/services, customer connections, main processes, and support and management processes. Organizations must tackle these areas in order to avoid falling behind in digital transformation. The description of the five pillars of digitalization is crucial as it effectively demonstrates the extent to which AI is revolutionizing the operational processes of banks, as it can contribute to all the fundamental aspects of digitalized processes.

2.4.1. Applications of artificial intelligence

This subsection delves into the most prevalent and significant uses of AI in the banking industry, as documented in the literature, with a specific emphasis on applications that directly interact with customers. Drawing from the articles, examples, and case studies in the literature, the primary domains in which AI finds the most widespread application within the banking industry will be outlined. Under the primary categories, certain solutions will be delineated, while not necessarily encompassing all potential application domains.

Customer service – chatbots

One of the most widespread applications of the technology is the customer service chatbot using AI (Doherty & Curran, 2019). Financial institutions are now progressing towards the concept of "conversational banking", which refers to the incorporation of messaging applications into the banking customer experience, perhaps resulting in increased customer satisfaction (PwC, 2017). Chatbots can be based on ML, NLP or even speech recognition. This allows them to address client inquiries and requests, such as analyzing their purchasing patterns, providing a list of nearby ATMs, and informing them of their current account balance. Furthermore, this enables financial institutions to provide novel and captivating experiences, therefore enhancing their rapport with the customer (Doherty & Curran, 2019).

A vital characteristic of chatbots is the program's accessibility. For instance, it is crucial that the consumer can promptly locate the chatbot on the bank's website. Furthermore, the bank should prioritize the enhancement of the chatbot to ensure its compatibility with mobile devices, because a substantial number of customers nowadays access the internet through their mobile phones (Trivedi, 2019). Furthermore, speed is a crucial aspect, as a chatbot should deliver a response within seconds. Moreover, chatbots have the capability to obviate the necessity for extensive and intricate forms and surveys by means of voice assistants and real-time video

consultations. However, it is crucial to guarantee the dependability of the system, considering that financial transactions and queries include sensitive data (Kerkez, 2020).

Advisory Services – Robo-advisors

Aside from chatbots, the literature abundantly mentions robo-advisory systems (Abraham et al., 2019). Robo-advisors are fundamentally transforming the advisory practice. These platforms are automated systems that use algorithms to offer financial and investment guidance by analyzing the data they gather about the user or client (European Banking Federation, 2019). To ensure the optimal performance of a robo-advisor, it is crucial to create a comprehensive investor profile of the client, encompassing factors such as their risk tolerance, investment goals, and time scale (Abraham et al., 2019). While it is common to encounter robots that mostly provide guidance, there are other robots capable of automatically executing transactions. A clear distinction can be made between robots that provide direct advice to the user and robots that support human advisors in their professional duties (European Banking Federation, 2019).

It is important to note, that despite the existence of completely automated robo-advisors, banks do not inherently employ robots to substitute human interactions (Abraham et al., 2019). In terms of the technology that underpins robo-advisory, they are cognitive systems that are constructed using NLP and ML (European Banking Federation, 2019). According to KPMG (2016) robo-advisors must fulfill three main features: account aggregation (enabling investors to access a complete overview of their various accounts with a single login), automated investments (facilitating automatic transfers from their savings account to their investment account), and the ability to engage with a human advisor (thereby eliminating the limitations of the "one-size fits all" model).

It is also essential to consider the spending advisory capabilities of robo-advisory. AI-supported spending advisory services provide personalized insights and recommendations that improve financial decision-making. Banks are capable of utilizing extensive data sets to identify spending patterns, which allows them to provide personalized spending advice that is consistent with the financial objectives of each individual (Belanche et al., 2019).

Fraud detection regulatory services

Banks must prioritize fraud prevention. These attempted forgeries can be directed at a variety of financial institutions, including cashless payments, online payments, money transfers,

identity, or bank cheques. Fraud detection systems are specifically developed to address and mitigate such a potential danger. The process comprises the activities of gathering, analyzing, and extracting knowledge from financial data (European Banking Federation, 2019). This software implements data analysis techniques to identify potentially fraudulent transactions and attacks aimed at clients' accounts. It can both thwart fraudulent activities and promptly notify the person who has been targeted about the identified fraudulent attempt (Szikora & Nagy, 2020).

Automatized payment

Through the analysis of client data and prediction of payment habits, AI-driven systems can streamline transactions and improve the efficiency of payment processing. For example, AI can assist in generating customized notifications for bill payments, therefore decreasing late charges, and enhancing customer service. Moreover, the integration of AI in mobile banking applications enables users to effortlessly handle their utility bills using their smartphones, therefore offering immediate access to account details and transaction records (Szikora & Nagy, 2020).

Furthermore, AI has greatly enhanced the deposit-making procedure, in addition to bill payments. Algorithmic systems powered by artificial intelligence can examine consumer behavior and preferences, enabling banks to provide customized deposit solutions that cater to specific requirements (Al-Araj et al., 2022).

2.4.2. Regulatory compliance

In recent years, financial institutions have encountered a substantial rise in regulatory obligations, making it more difficult for them to comply with their own internal regulations. They are frequently required to incorporate thousands of new regulatory documents, each with intricate ramifications for their operations. Compliance is of utmost importance, as errors might result in significant sanctions (Chartis Research - IBM, 2018). AI offers a solution by leveraging NLP, automating processes, identifying relevant rules, and prioritizing compliance tasks. With its learning capabilities, AI can continuously refine its proposals, thereby enhancing the efficiency of regulatory compliance (GIEOM - IBS Intelligence, 2018).

2.4.3. Challenges of using artificial intelligence in the banking sector

While there are numerous sources and literature on the benefits of AI in the banking sector, and many real-world, positive examples of its use, in many cases financial institutions are hesitant

or have difficulties in implementing the technology, as the application of AI in critical infrastructures (as the banking industry) presents many challenges because of their unpredictable characteristics. Mostly, these concerns center on matters of safety, precision, reliability, and cybersecurity (AL-Dosari et al., 2024).

Additionally, there are substantial dangers associated with ethical considerations, including algorithmic bias and data privacy. As formerly mentioned, banks must navigate intricate regulatory environments to ensure compliance while implementing AI solutions, a process that can be resource-intensive and may impede the adoption process (Al-Baity, 2023). A further concern is the rapid evolution's impact on the daily operation. This growth requires ongoing staff training and updates, which can be challenging in an industry that is already dealing with high labor costs and turnover rates (Khan et al., 2022).

Numerous opportunities within the banking value chain are currently untapped, where AI's potential is underutilized (Capgemini, 2024). Overall, it is crucial that banks address these challenges to fully leverage the potential of AI, while simultaneously ensuring the security and trust of their operations.

2.5. Hypotheses

Based on the insights obtained from the literature review and considering the specificities of the banking industry, the hypotheses for the study were developed in relation to the research question stated in the thesis introduction. The hypotheses were formulated to address both technological and demographic factors that the literature suggests are critical in shaping consumer attitudes toward AI.

The literature on digital transformation and technology adoption regularly highlights that knowledge and comprehension of technology can greatly decrease uncertainty and perceived risk, promoting a more positive attitude toward its use (Warner & Wäger, 2019). Furthermore, Sathye (1999) disclosed that customers' reluctance to implement online banking is significantly influenced by the low awareness of online banking, as consumers are unaware of the advantages and disadvantages that online banking systems can offer. In the realm of artificial intelligence (AI) in banking, awareness encompasses more than mere recognition of the existence of these technologies. It also demands comprehension of their operational mechanisms, advantages, and ramifications for security and privacy. Research has demonstrated that comprehensive knowledge of AI applications, such as chatbots or fraud detection systems, enhances consumer

trust and facilitates their integration into everyday banking operations (Jarek & Mazurek, 2019). Thus, the following hypothesis (H1) is proposed to understand whether increasing consumer awareness can serve as a strategy for banks to enhance the customer's acceptance of AI.

Hypothesis H1: *Awareness of AI technologies has a positive effect on consumers' acceptance of AI in banking services.*

Furthermore, the literature underscores that trust is a fundamental element in the adoption of new technologies, particularly in sectors like banking where security, privacy, and reliability are paramount (Hamzah et al., 2017). In the context of AI, trust becomes even more significant as these technologies often operate autonomously, making decisions and performing tasks that traditionally require human intervention. Consumers need to feel confident that AI systems, will act in their best interests and safeguard their sensitive financial information (Roberts-Lombard & Petzer, 2021). Therefore, the following hypothesis (H2) aims to explore the extent to which the customers' perceived trust in electronic security influences the willingness of consumers to embrace AI in their banking interactions.

Hypothesis H2: *Trust in electronic security has a positive effect on consumers' acceptance of AI-supported banking services.*

The third hypothesis (H3) is grounded in the substantial body of literature that emphasizes the importance of CX in the adoption of new technologies. In the competitive banking industry, providing a seamless, efficient, and satisfying customer experience is recognized as a critical factor in retaining customers and encouraging the adoption of new digital services (Northey et al., 2022). Research indicates that customers are more inclined to adopt and include AI technologies into their everyday banking operations when they have positive experiences with these technologies, which are defined by their user-friendliness, reliability, and alignment with their requirements (Zhongqing et al., 2019).

Hypothesis H3: *Positive customer experience has a positive effect on consumers' acceptance of AI in banking services.*

Lastly, the literature suggests that younger generations are more inclined to embrace new technology, such as AI, compared to older generations who may have less knowledge or ease with such innovations (Brown, 2023). Moreover, older individuals may have a greater inclination towards conventional, in-person banking contacts and may be less comfortable with

entrusting automated systems with their financial affairs (Mullineux, 2012). To examine this trend, the following hypothesis (H4) was formulated:

Hypothesis H4: *Age has a negative effect in accepting AI-supported banking services.*

3. Methodology and research design

This chapter is dedicated to empirical research, building on the theoretical foundation established in the previous section. It outlines the methodological procedures implemented to address the research question and to evaluate the hypotheses that were defined in the preceding section.

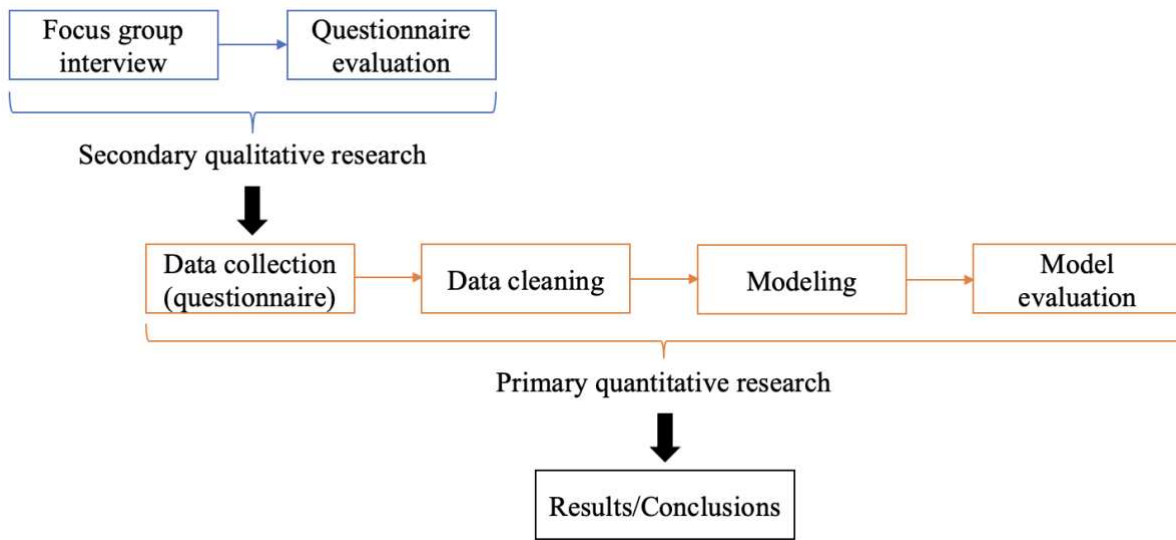
3.1. Research design

To test the hypotheses quantitative analysis was conducted with the complementary support of qualitative research. Multiple factors explain why a quantitative research method is the most suitable approach for addressing the research question and testing the hypotheses, these factors are presented in the forthcoming sub-chapter.

Initially, this thesis intends to evaluate hypotheses based on the ongoing academic discussion and to confirm existing theories. This testing is most effectively conducted using a quantitative methodology (Tranfield et al., 2003), which enables the evaluation of the statistical significance of correlations between variables and contributes to scholarly discussion by evaluating existing knowledge (Döring & Bortz, 2016). This methodology adopted a structured data collection process based on a sample of participants, as an applied scientific research approach (Döring & Bortz, 2016). As it was an original study – no previously undertaken study was replicated (Döring & Bortz, 2016) – to the best of my knowledge there was no usable dataset available to test my hypotheses, thus primary research was conducted. The knowledge interest of the analysis was explanatory, since it involved testing the validity of a set of hypotheses originated from theory. The primary research in this work was conducted through statistical sampling, where a sample of respondents from the population was analyzed and summarized (Döring & Bortz, 2016).

To enhance the significance and validity of the main data collection method, the research started by conducting focus-group research (please refer to the “Questionnaire Design and Variables” sub-chapter for details on the interview process). Note that the focus-group interview aids only the validation of the questionnaire, however, for answering the hypotheses conclusively, the quantitative findings prevail.

1. Figure: Proposed Research Design

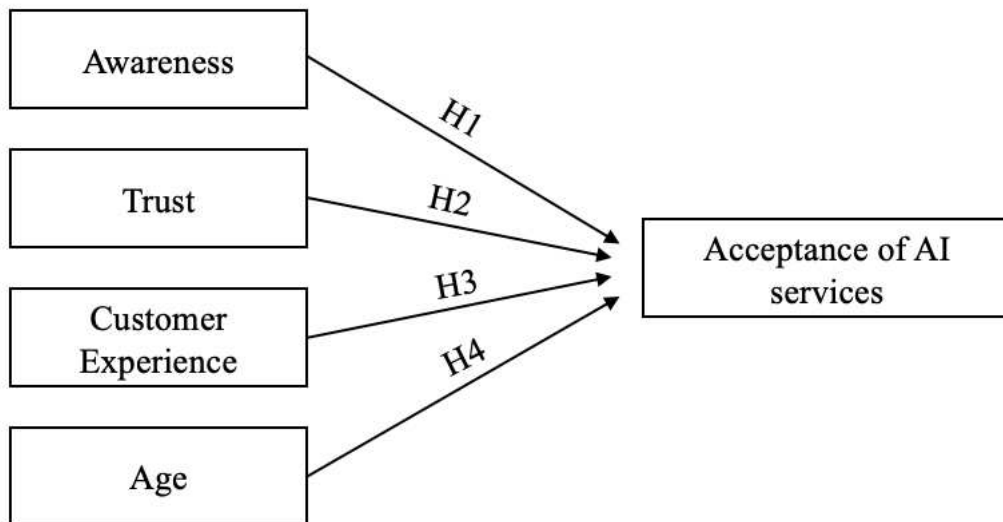


Source: Own graphical representation

3.2. Model Definition

The objective of the study is to examine the factors that affect the level of customer acceptance of AI technology in the banking industry. Previously outlined hypotheses in Chapter 2 are intended to investigate which specific areas, chosen from the literature, have a substantial impact on the Acceptance of AI services. In order to present the proposed hypotheses, the model on 2. Figure was created:

2. Figure: Proposed Conceptual Model



Source: Own graphical representation

As the research question aims to analyze the relationship between different consumer perceptions and consumer acceptance of AI-enabled technologies, thus this research approach mainly investigates the correlations among variables (Döring & Bortz, 2016). For this approach, a linear regression model seems appropriate, as it is a statistical technique that allows researchers to evaluate the strength and direction of the relationships between a dependent variable and independent variables. This method enables the estimation of the expected change in the dependent variable because of a unit change in each independent variable, thereby demonstrating the relative significance of each factor (Baabdullah et al., 2019). Moreover, according to Wooldridge (2016) the sample size of 121 observations is insufficient for the application of more complex estimation methods. Finally, this research thesis seeks to advance theory by providing generally applicable findings within the limitations of the study (Wooldridge, 2016).

Based on these specifications the following equation will be used to test the hypotheses:

$$\text{Acceptance of AI services} = \beta_0 + \beta_1(\text{Awareness}) + \beta_2(\text{Trust}) + \beta_3(\text{Customer Experience}) + \beta_4(\text{Age}) + \epsilon$$

3.3 Data Collection Method

To test the hypotheses, an online questionnaire was created to efficiently reach a large number of participants in a short timeframe (Reinders et al., 2015). The survey was created on Qualtrics tool, it was distributed on social networks (such as LinkedIn or WhatsApp), and in person as well. The target population was only characterized by the use of e-banking services, thus the selection of participants was based on and limited by one control characteristic. The questionnaire was active from 2024.08.26. until 2024. 09. 04.

The survey's distribution strategy may add bias by favoring those with strong social networks and familiarity using online resources, possibly ignoring older individuals or people who use social media less frequently. Furthermore, respondents that opt to take part in online surveys are frequently more driven or have stronger ideas about the subject, which could bias the results in favor of respondents with stronger beliefs regarding AI in banking and underrepresent more neutral viewpoints.

A stratified sampling strategy could be employed to select participants from different subgroups, such as age, income, and geography, to increase the representativeness of the sample. To guarantee greater involvement, distribution methods should be expanded to include email or postal mail in addition to collaborating with financial institutions to directly contact e-

banking users. Offering incentives and extending the survey availability would be beneficial as well.

3.4 Questionnaire Design and Variables

A comprehensive structured questionnaire was developed to facilitate data analysis and acquire statistical indicators. The survey's questions were created based on literature (presented in 2. Table), ensuring that the constructs measured are consistent with accepted theoretical frameworks and have been supported by other studies. This improves the data's validity and dependability, enabling insightful comparisons and solid conclusions.

In order to guarantee that the questionnaire contained the right questions and, as a result, provided the study with relevant data, qualitative research was implemented as well. The four primary hypotheses were presented following the existing literature, however, due to the novel nature of the topic, I intended to determine whether the participants comprehended my survey or if additional clarification or explanation was required. This qualitative research was a focus group with 6 participants. I presented the survey to them during the focus group, and we discussed their experience with e-banking in general and their awareness of AI-enabled services in the banking industry. The guide for the interview can be found in Appendix B. We engaged in a conversation regarding the queries posed in the questionnaire, as well as any necessary clarifications. Additionally, the participants were requested to provide feedback. The survey was modified by the discussion, with the primary changes being the clarification of certain questions, the inclusion of additional background information, and the modification of the wording.

The final version of the survey included closed questions and statements, asking respondents to choose from predetermined response options. The questionnaire was divided into different sections, each aiming to discover different parts of the research. Table 1 illustrates the structure of the questionnaire, while for the whole questionnaire please refer to Appendix A.

1. Table: Questionnaire structure

Section	Subject
[S1]	Questionnaire Title and Disclosure
[S2]	Summary of the topic and Control Characteristic
[S3]	Testing of Technology Awareness
[S4]	Perception of Trust
[S5]	Exploring Customer Experience
[S6]	Customer Acceptance of AI Services
[S7]	Socio-demographic Information
[S8]	Goodbye

Source: Own representation

The questionnaire title “AI in the banking industry” provided a broad idea about the topic of the survey, while the disclosure provided a clear explanation of its aim and specifications to the participants, highlighting that participation was voluntary and that anonymity would be guaranteed. The following 6 sections were aimed to gather the necessary data for the research. The first part provided a comprehensive description and fundamental details regarding the topic at hand, together with the control characteristics. Upon selecting the "I do not use e-banking services" choice, respondents were automatically sent to the final page of the questionnaire. This measure guaranteed that the participants were part of the research target population, therefore enabling their responses to provide significant information for the study. The second part focused on the participant’s awareness of AI technology in the banking system and their technological curiosity as well. In the third section, the survey measured their perceived trust towards online banking services and AI technology. In addition to assessing whether customers utilize these services at all, the fourth section evaluated their current experience with various AI-enabled services. Its purpose was to demonstrate the current extent of the widespread adoption of these technologies. The fifth part of the questionnaire was aimed to identify their level of comfort with the idea of using AI for the specified banking services, as well as their acceptance of their bank using AI in general. The sixth component of the questionnaire gathered demographic data, encompassing (a) gender, (b) age, (c) education, and (d) employment status. At the end of the questionnaire, a thank you message was portrayed to the participants.

In the sections [S3]- [S6] the survey items employed a 5-point Likert scale to assess the independent variables created by the constructs. The Likert scale allowed participants to express their level of agreement with different statements, which then assigned a numerical value to their answers.

In general, the survey was created to guarantee a sufficient set of variables for the examination of the hypotheses.

The research focuses on “Acceptance of AI services” dependent variable (Payne et al., 2018), where the three out of the four independent variables are collected based on three constructs: Awareness, Trust, and Customer Experience. Awareness (J. S. Chen et al., 2021; Rahman et al., 2023) measures the customer’s awareness of using AI technologies and their knowledge about the benefits of the technology. Trust (Payne et al., 2018) refers to the customer’s perceived trust in electronic security. Customer experience (Payne et al., 2018) aims to measure the customer’s satisfaction during their experience with AI-enabled services. The fourth independent variable is the Age category. Furthermore, control variables were included based on literature (Piotrowski, 2022) and socio-demographic information.

2. Table: Questionnaire's scale items of constructs

<i>Variable</i>	<i>Items</i>	<i>Literature</i>
<i>Social media</i>	[Q1] Frequency of using social media	Piotrowski (2022)
<i>Filter question</i>	[Q2] Frequency of using e-banking services (Internet or mobile banking)	
<i>Awareness</i>	[Q3] Testing new technological solutions [Q4] Information sufficiency about the different AI-enabled technologies in banking services [Q5] Information sufficiency about the benefits of AI-enabled technologies in banking services [Q6] Information sufficiency on how my bank is using AI-enabled technologies in its services [Q7] Never receive information about the usage of AI-enabled technologies in banking services	Rahman et al. (2021) Chen et al. (2021)
<i>Trust</i>	[Q8] Banks use client’s personal data ethically [Q9] My bank's mobile app and virtual interface are secure [Q10] My bank's mobile app and virtual interface are reliable [Q11] My bank's mobile app and virtual interface have good technical features [Q12] The resources provided by my bank help me to confidentially solve problems [Q13] My bank's electronic security meets my needs [Q14] Bank’s AI-driven services implement strong security measures	Payne et al. (2018)

<i>Customer experience</i>	[Q15] Satisfaction with automated bill payment [Q16] Satisfaction with automated deposits made from your account [Q17] Satisfaction with chatbots and virtual assistants [Q18] Satisfaction with receiving investment advice using robo-advisors [Q19] Satisfaction with receiving personalized spending advice [Q20] Satisfaction with regulatory compliance (e.g. reporting suspicious activities)	Payne et al. (2018)
<i>Acceptance of AI services</i>	[Q21] Level of comfort of using AI for paying bills [Q22] Level of comfort of using AI for making deposits [Q23] Level of comfort of using AI for having a conversation with AI enabled chatbots and virtual assistants [Q24] Level of comfort of using AI for getting personalized investment advice (robo-advisory) [Q25] Level of comfort of using AI for getting personalized spending advice [Q26] Level of comfort of using AI for regulatory compliance [Q27] Level of comfort of using AI for banking	Payne et al. (2018)
<i>Gender</i>	[Q28] Gender	-
<i>Age</i>	[Q29] Age	-
<i>Education</i>	[Q30] Education	-
<i>Occupation</i>	[Q31] Occupation	-

Source: Own representation

4. Data Analysis

This chapter provides a comprehensive examination of the data collected through the online survey, aiming to formulate relevant answers to the study's research question.

4.1 Data preparation

Data preparation is an essential phase in data analysis. The foundation for an accurate and insightful analysis is laid by ensuring the data is consistent, clean, and properly formatted (Wamba, 2017).

The data analysis was based on a sample of 122 individuals, who filled out the online survey. However, as the study focuses on the perception of AI in online banking services, the participants who did not meet the formerly established criteria – usage of e-banking services – were excluded from the analysis. As a result, the final sample size was reduced to 119 valid participants, all of whom provided answers to every question.

The dataset portrayed variable names, which were generated from the questionnaire, thus they were non-intuitive and did not provide clear insight into the data they represented. For this reason, it was important to rename the variables, for instance, the variable Q66, which corresponded to participants' age, was renamed to “Age”.

Multiple categorical factors, such as Social Media or Education, were included in the dataset. To address this, dummy variables were created to convert these categories into binary numerical data.

4.2. Variables

Conducting a descriptive analysis is essential before beginning the modeling procedure. This step's objective was to display the data's general structure, along with important metrics like the mean, median, range, and distribution, and to spot any probable outliers or missing numbers. To find any anomalies or peculiar data points that can compromise the correctness of subsequent models, descriptive analysis is essential. Furthermore, it facilitates the investigation of correlations among variables to verify their expected behavior, offering a foundational comprehension and emphasizing the necessity for possible data modifications prior to advancing to more intricate studies. The following sub-chapter shows the variables that were used and their descriptive statistic.

4.2.1. Dependent Variable

The key dependent variable, “Acceptance of AI services” has a mean of 3.17 and a standard deviation of 1.11, indicating a generally neutral to slightly positive sentiment toward AI in banking. The summary statistics table can be found in Appendix C.

4.2.2. Independent and Control Variables

The initial survey contained 8 variables representing the three constructs and the control variables based on the literature review. Control variables were incorporated into the regression model to confirm the accuracy of the results. By adjusting for confounding variables that may skew the connection between the independent and dependent variables, these variables, while not the main focus of the research, aid in reducing bias. Including these control variables ensures that other known influences are considered, enabling a more in-depth analysis of the primary interactions under investigation.

This analysis of the independent variables offers some important information about the examined database. According to the descriptive statistics (see in Appendix C), individuals' levels of trust are generally constant, with an average score of moderate ($M = 3.42$, $SD = 0.70$). The data on awareness exhibits higher variability, showing a wider range of participant awareness, with a lower mean ($M = 2.22$, $SD = 0.83$). The most varied category is customer experience ($M = 2.43$, $SD = 1.12$), which highlights a wider variety of answers.

4.3. Socio-demographic Data Characterization

Some background information for the analysis is also provided by the demographic data. With 56.3% of the population being male and 43.7% being female, the gender distribution is generally balanced, and the data does not demonstrate any obvious gender bias. 66.4% of respondents in the sample are 34 years of age or younger, indicating that the sample is predominately younger than the banking population. More precisely, 29.4% of the population is between the ages of 18 and 24, whereas only 21% of banks' customer base falls into that age category according to the World Retail Banking Report (Capgemini, 2024), and 37% is between the ages of 25 and 34. This bias toward younger demographics may have resulted from the survey's distribution. The sample has a high level of educational achievement; 34.5% of respondents have a bachelor's degree and 50.4% of respondents have a master's degree. In total, 84.9% of participants have at least a bachelor's degree, indicating, that lower educational levels are underrepresented. The employment status of the participants shows a largely full-time workforce, with 66.4% of respondents employed full-time.

Overall, the sample is characterized by a highly educated, young population, the majority of whom work full-time. Because the study may more strongly represent the viewpoints of these groups, it can be considered as a potential limitation of the study as it's not representative of the wider population.

3. Table: Distribution of Socio-demographic Characteristics

Category	Subject	Number of responses	Percentage of responses
Gender	Female	52	43,7
	Male	67	56,3
Age	18-24	35	29,4
	25-34	44	37
	35-44	11	9,2
	45-54	10	8,4
	55-64	19	16
Education	Associate's degree	3	2,5
	Bachelor's degree	41	34,5
	High school diploma or equivalent	15	12,6
	Master's degree	60	50,4
Occupation	Employed full-time	79	66,4
	Employed part-time	9	7,6
	Retired	1	0,8
	Self-employed	1	0,8
	Student	26	21,8
	Unemployed	3	2,5

Source: Own representation

4.4. Reliability and Internal Consistency

Before running the regression analysis, it is important to validate the constructs, which represent the characteristics of Awareness, Trust, and Customer Experience. Thus, the internal consistency of the scale was examined using the Cronbach Alpha test and the item-total correlation of each variable to assess the reliability of the data.

Each of the three constructs created for the independent variables is represented by an average score of the items. However, these constructs need to be verified before this can be done. Hair et al. (2009) suggests an analysis of internal consistency. Thus, through the examination of internal consistency, the reliability of each construct – that is, the measurement of the degree of consistency in the numerous measures of a variable – will be examined (Hair et al., 2009). A factor's internal consistency comes from the idea that each of its items measures the same

construct and is therefore closely related to the others (Taber, 2018). A reliability coefficient measures the degree of consistency with which a group of elements, such as survey questions, represent the same fundamental idea (Taber, 2018). There are multiple categorization in the literature regarding the strength of association. This research follows the suggestion of Cortina (Cortina, 1993).

4. Table: Cronbach's Alpha categories

<i>Cronbach's Alpha Range</i>	<i>Strength of Consistency</i>
0.90 and above	Excellent Internal Consistency
0.80 – 0.89	Good Internal Consistency
0.70 – 0.79	Acceptable Internal Consistency
0.60 – 0.69	Questionable Internal Consistency
Below 0.60	Poor Internal Consistency

Source: Cortina (1993)

Another index measured for this test is the corrected item to total correlation, which displays the correlation between the item itself and the scale score without that item. This value should be 0.40 to indicate a very good discrimination index (Cristobal et al., 2007).

In 5. table is presented the internal consistency of the Awareness construct of the study and also the corrected item-total correlation of each item and Cronbach's Alpha value if the item was deleted from the construct.

5. Table: Awareness Cronbach's Alpha

<i>Construct and correspondent item</i>	<i>Corrected Item Total Correlation</i>	<i>Cronbach's Alpha if Item Deleted</i>	<i>Cronbach's Alpha</i>
Awareness			0.33
[Q3] Testing new technological solutions	0,54540513	0,108776772	
[Q4] Information sufficiency about the different AI-enabled technologies in banking services	0,724145271	-0,265722241	
[Q5] Information sufficiency about the benefits of AI-enabled technologies in banking services	0,663251733	-0,241576837	
[Q6] Information sufficiency on how my bank is using AI-enabled technologies in its services	0,483023052	-0,036886135	
[Q7] Never receive information about the usage of AI-enabled technologies in banking services	-0,682287179	0,834755638	

Source: Own representation

The results show that the consistency of the Awareness construct is poor with including all the items ($\alpha=0,33$), but we can see that if the item „Never receive information about the usage of AI-enabled technologies in banking services” is removed the consistency will increase to a good level of consistency ($\alpha= 0,83$). Since this item presents a negative discrimination index and measure the Awareness construct with 4 items. Running the calculation without the removed item it shows a good ($\alpha= 0,83$) consistency. It is visible, that the consistency could be further improved by

removing the first item, however, as it has a strong item-total correlation of 0,6451 – which indicates that the item contributes well to the scale and it is consistent with other items – it was decided to keep in the analysis.

6. Table: Final Awareness Cronbach’s Alpha

<i>Construct and correspondent item</i>	<i>Corrected Item Total Correlation</i>	<i>Cronbach's Alpha if Item Deleted</i>	<i>Cronbach's Alpha</i>
Awareness			0.83
[Q3] Testing new technological solutions	0,64518089	0,924551949	
[Q4] Information sufficiency about the different AI-enabled technologies in banking services	0,865122697	0,703630735	
[Q5] Information sufficiency about the benefits of AI-enabled technologies in banking services	0,826215984	0,715307376	
[Q6] Information sufficiency on how my bank is using AI-enabled technologies in its services	0,692357211	0,778511176	

Source: Own representation

The Trust construct presents a good consistency ($\alpha=0.87$), and the model didn’t suggest any significant changes for improvement.

7. Table: Trust Cronbach’s Alpha

<i>Construct and correspondent item</i>	<i>Corrected Item Total Correlation</i>	<i>Cronbach's Alpha if Item Deleted</i>	<i>Cronbach's Alpha</i>
Trust			0.87
[Q8] Banks use client’s personal data ethically	0,590426679	0,866667202	
[Q9] My bank's mobile app and virtual interface are secure	0,670173378	0,855255808	
[Q10] My bank's mobile app and virtual interface are reliable	0,769271749	0,842891718	
[Q11] My bank's mobile app and virtual interface have good technical features	0,594443806	0,864669707	
[Q12] The resources provided by my bank help me to confidentially solve problems	0,65265251	0,857775634	
[Q13] My bank's electronic security meets my needs	0,741502395	0,846019756	
[Q14] Bank’s AI-driven services implement strong security measures	0,614902398	0,864572328	

Source: Own representation

Lastly, the Customer Experience construct also presents a good consistency ($\alpha=0.8$), thus all the items were kept in the construct.

8. Table: Customer Experience Cronbach’s Alpha

<i>Construct and correspondent item</i>	<i>Corrected Item Total Correlation</i>	<i>Cronbach's Alpha if Item Deleted</i>	<i>Cronbach's Alpha</i>
Customer Experience			0.8
[Q15] Satisfaction with automated bill payment	0,546636911	0,769918059	
[Q16] Satisfaction with automated deposits made from your account	0,605713129	0,756085056	
[Q17] Satisfaction with chatbots and virtual assistants	0,446046539	0,790810614	
[Q18] Satisfaction with receiving investment advice using robo-advisors	0,719073161	0,729558721	
[Q19] Satisfaction with receiving personalized spending advice	0,620872968	0,752238823	
[Q20] Satisfaction with regulatory compliance (e.g. reporting suspicious activities)	0,407275586	0,802619921	

Source: Own representation

4.5. Testing Linear Regression Model Assumptions

To receive valid and reliable results from the linear regression model, several underlying assumptions must be satisfied. An overview of the findings of these tests will be provided below. Overall, the linear regression model is appropriate for the data, only the Trust variable suggests some slight non-linearity. These findings give us further confidence in the validity and reliability of the regression analysis. They essentially mean that the model is well-specified, and the links we have established between independent factors, and the dependent variable will more than likely be significant. While these tests provide important support for our model, they do not guarantee strict adherence to all assumptions.

4.5.1. Independence of Errors

The Durbin-Watson test was used to assess the residuals of the regression model's assumption of independence. The Durbin-Watson statistic of 1.85 indicates minimal to no autocorrelation in the residuals, as it is close to the ideal value of 2. Furthermore, the p-value of 0.24 is greater than the 0.05 threshold, so it suggests that the test does not provide sufficient evidence to reject the null hypothesis of no autocorrelation. Thus, the assumption of independence in the residuals is likely met.

4.5.2. Homoscedasticity

An assessment of the assumption of homoscedasticity in the regression model was conducted using the Breusch-Pagan test. The test yielded a Breusch-Pagan statistic of 21.682, with 20 degrees of freedom, while the associated p-value is 0.358. As the p-value is greater than the significant threshold of 0.05, the null hypothesis of homoscedasticity cannot be rejected. This indicates that there is no significant evidence of heteroscedasticity in the model.

4.5.3. Normality of Residuals

Other assumptions of linear regression include the proper distribution of residuals. To test for such the Shapiro-Wilk test was used. The test yielded a p-value of 0.6360. Since this p-value is greater than 0.05, we fail to reject the null hypothesis of normally distributed residuals. That indicates that the residuals would have a high likelihood of being normally distributed, hence meeting the normality requirement.

4.5.4. No Multicollinearity

In the next stage, we assessed the robustness of our model by testing the independent variables for multicollinearity. None of the scaled VIF values, which range from 1.41 to 1.69 (see in Appendix D), exceed the threshold of 5, indicating that there is no significant multicollinearity, and it is unlikely to affect the stability of the model's estimate.

4.5.5. Linearity

At last, linearity had to be assessed as well. To see the linearity of the different independent variables Component plus Residual Plots were created in R, which are attached in Appendix D.

From the plots, we can see that connecting Awareness to the dependent, Acceptance of AI services, the smoothed curve suggests a near-linear relationship, while the linear fit indicates that their relationship can be approximated by a linear model, thus the linearity assumption for Awareness can be accepted.

Examining the connection between trust and Acceptance of AI services shows that the extremes indicate some non-linear pattern, thus there may be some non-linearity in their relationship.

The Customer Experience variable appears to have an approximately linear relation to the dependent variable, this way the assumption can be held.

To see the fit of the Age variable we can say that the model appears to fit fairly well. However, at younger age groups there is a slight sign of under-prediction, while the older groups show a slight over-prediction of Acceptance of AI services. In the case of the younger demographic section, it can be caused by the outliers that are present.

4.6. Regression model

To test the four hypotheses outlined in Chapter 2, the equation outlined in the 3.2. Model definition section was tested. This test involved the execution of a multiple regression analysis.

All four independent variables were included in the model: *Awareness*, *Trust*, *Customer experience*, and *Age*, furthermore, the previously determined control variables were included. Controlling for these factors, even if they are not of major interest to the study, guarantees a more precise estimation of the impacts of the main independent variables. For the variables Social media, Gender, Education, and Occupation dummy variables were created so it was important to omit one category from the categorical variable. These reference categories helped to avoid the dummy variable trap. The full regression model can be found in Appendix E.

The multiple R^2 shows a relatively good fit of the model to the data, as 69.39% of the variation in Acceptance of AI services. can be explained by the independent variables. The adjusted R -squared further confirms this statement with its value of 0.6314. However, as it is lower than the multiple R^2 it indicates that some of the predictors may not be adding much value. Though

the drop is not huge, thus we can assume that the model is not overfitted and has predictive power. The p-value (2.2e-16) confirms that the model is statistically significant.

9. Table: Model summary

<i>Res. Std. Error</i>	<i>Multiple R-squared</i>	<i>Adjusted R-squared</i>	<i>F-statistic</i>	<i>p-value</i>
0.6768 on 98 degrees of freedom	0.6939	0.6314	11.11 on 20 and 98 DF	< 2.2e-16

Source: Own representation

Looking at the coefficients of the independent variables we can see that Trust and Age are statistically significant out of the four independent variables.

Trust appears to be the most significant, as its p-value is extremely low ($5.28e-09 < 0.001$). This indicates that customers' perceived trust in electronic security has a highly statistically significant relationship with customers' acceptance of AI-enabled services in their banking services. The model shows, that ceteris paribus, every one unit increase in trust (meaning the customers' opinion in the scale of Strongly Disagree – Disagree – Neutral – Agree – Strongly Agree) increases the dependent variable by 0.76153 units ($\beta_2 = 0.76153$).

The less significant variable, which is still statistically significant ($p = 0.00143$, thus $p < 0.01$), is the Age. It has a negative relationship with the dependent variable ($\beta_4 = -0.82891$), meaning that ceteris paribus, older individuals (individuals with a higher Age value) are predicted to have a lower comfort level of using AI-enabled solutions during their banking activities.

While Awareness and Customer experience show positive estimates ($\beta_1 = 0.1385$ and $\beta_3 = 0.07435$), they are not statistically significant on the 5% level, thus their connected hypotheses, H1 and H3 cannot be accepted.

10. Table: Output regression analysis

	<i>Estimate</i>	<i>Std. Error</i>	<i>t value</i>	<i>Pr(> t)</i>
(Intercept)	0.56273	0.82402	0.683	0.49627
Awareness	0.13850	0.10420	1.329	0.18689
Trust	0.76153	0.11893	6.403	5.28e-09***
Customer experience	0.07435	0.07694	0.966	0.33628
Age	-0.82891	0.25252	-3.283	0.00143**

Source: Own representation

Additionally, the analysis showed, that men reported having a lower level of acceptance on a 5% significance level, while individuals whose highest education level is a high school diploma or equivalent show a lower level of acceptance compared to the other groups. This finding is interesting, as it indicates that education level could have an influence on the dependent variable, which is probably not caused in relation to age, as the younger people proved to be more comfortable with the novel technology. However, this would need further investigation to declare, thus we can't draw this specific conclusion based on this model.

4.4.5 Hypotheses testing

Following the analysis, we gathered all the necessary information to evaluate the hypotheses. Based on the p-value for Awareness (0.18689), we fail to accept H1. However, Trust showed a high level of significance, allowing us to accept H2. For Customer Experience, the p-value (0.33628) indicates a lack of significance, leading us to reject H3. Finally, Age proved to be a significant variable in the model, supporting the acceptance of H4.

11. Table: Hypotheses and Results

<i>Hypotheses</i>	<i>Result</i>
H1: Awareness of AI technologies has a positive effect on consumers' acceptance of AI in banking services.	Rejected
H2: Trust in electronic security has a positive effect on consumers' acceptance of AI-supported banking services.	Accepted
H3: Positive customer experience has a positive effect on consumers' acceptance of AI in banking services.	Rejected
H4: Age has a negative effect on accepting AI-supported banking services.	Accepted

Source: Own representation

5. Discussion

The objective of this study was to explore the factors influencing customer acceptance of AI in the banking sector. Specifically, it examined the role of awareness, trust, customer experience, and age on how customers perceive this novel technology. Based on the study of the literature and the conducted quantitative research we could gain some important insights.

5.1. Contribution to existing theory

As the study's main goal was to contribute to scholarly discussion by evaluating existing knowledge, it is important to connect the main findings to lead the discussion. This part can be split into two parts: the approved and the rejected hypotheses.

After conducting the primary quantitative research, the most significant finding is the result of Trust (referring to perceived trust in electronic security) being a key independent variable in our analysis. The independent variable Trust refers to the customers' trust in electronic security (Payne et al., 2018). As the present study further confirms, trust in electronic security and the reliability of AI systems positively influence the comfort level of consumers in adopting AI-based banking services. This aligns with the findings of Hamzah et al. (2017), who emphasize the significance of trust in the financial sector, where security, privacy, and reliability are of the utmost importance. Given the autonomous nature of AI systems, consumers must have confidence that these technologies will protect their sensitive financial information and perform tasks in their best interest. This finding supports Hypothesis 2 (H2), which posits that trust in electronic security positively affects the acceptance of AI in banking. As previously stated, according to Roberts-Lombard & Petzer (2021) consumers must have the assurance that AI systems will act in their best interest and protect their sensitive financial information. This significant role of trust emphasizes the importance of electronic security measures and clear communication from the banks' side regarding AI's safeguards and benefits. The observed financial institution types (specified in Chapter 2.2.1.) should focus on ensuring the reliability of their AI-driven services.

Another confirmed hypothesis was H4, regarding age's influence on the customer's acceptance of AI technologies during their banking activities. H4 suggested that age is a significant demographic sector, with younger consumers displaying a higher level of comfort with AI technologies in banking. This finding aligns with Brown (2023), who stated that younger generations are generally more tech-savvy and open to adopting new digital technologies. The

strong negative correlation also suggests that older customers may prefer traditional banking methods, without the involvement of AI technologies.

Looking at the two variables in which the hypotheses were rejected, we can draw different conclusions. Contrary to expectations, the variables Awareness (referring to customers' awareness of using AI technologies) and Customer experience were not statistically significant, which creates an interesting contrast to existing literature. Literature indicates that customers' awareness of technology can reduce uncertainty and enhance its adoption (Warner & Wäger, 2019), the data analysis cannot confirm this idea. However, there are multiple reasons for this rejection. One reason for this could be that individuals are often unaware they are interacting with new AI technologies. This idea is also supported by the data (mean awareness score = 2.22). This highlights the need for these factors to be measured differently, focusing more on capturing subtle aspects of awareness and customer experience. Similarly, customer experience, measured in terms of satisfaction with AI-enabled services such as chatbots and robo-advisors, did not have a notable impact on customers' overall AI acceptance.

This finding rejects Hypotheses 1 (H1) and 3 (H3), but as literature consistently emphasizes the importance of customer experience, particularly in customer-facing applications, it remains a crucial element to consider. To further research it would be beneficial to assess these variables with different research models.

5.2. Limitations and Further Research

It is important to recognize the study's limitations. First off, the sample is non-probabilistic. It means that not every member of the population had an equal chance of being included. Bias may have been introduced by the homogeneity of the respondents' characteristics, as the questionnaire was predominantly distributed through the author's personal network. Because of this, the demographic distribution does not accurately reflect the overall population, limiting the generalizability of the findings. Furthermore, the sample size only consisted of 119 observations, which further restricts the possibility of generalizing the results to the larger population. Expanding the sample size in future research would enhance the robustness of the findings and improve the reliability of the conclusions drawn.

It must be noted that some signs of non-linearity in the model were detected, which could indicate that the results may be overfitted. Addressing this issue could provide a clearer understanding of the relationships between the observed variables. The fact that neither

Awareness nor Customer experience proved not to have an impact goes against the literature findings. This disparity suggests that further research is necessary to explore the role of these factors in more detail, possibly using different methodologies or a larger, more diverse dataset. These effects can be explored more deeply, as the assessment of customer experience is often influenced by nuanced factors that may only emerge when analyzed through specific usability testing and customer interviews.

Based on the control variables we can assume that there is a place for future research in exploring new variables that could influence the acceptance of AI technologies. As it was not specifically highlighted in the initial academic research it was not thoroughly analyzed in this study.

6. Conclusion

In recent years AI is transforming our whole world, including the financial sector and the banking industry. With automating processes, improving customer experience, and enhancing security measures inside financial organizations, AI operations are increasingly prevalent in banking operations. These technologies can improve financial advisory, expedite regulatory compliance, and enhance customer service. However, the adoption of AI presents some challenges to banks and other financial institutions, as it contains security risks and ethical concerns. Moreover, their customer-facing applications are – even though constantly evolving – still in their infancy compared to other areas of usage of AI. The existing literature on the topic highlights the importance of awareness, trust in electronic security, customer experience, and age as determining factors of customers' acceptance of the new technological solution.

This study explored the influence of these factors by leveraging a quantitative research method and presented some significant insights into what extent these variables affect the acceptance of AI. The results indicate that trust in electronic security is a critical determinant of consumer acceptance, with respondents displaying a strong inclination to embrace AI technologies when they perceive them as secure and reliable. Additionally, age was found to be an important factor, with younger consumers showing greater openness to AI compared to older generations. Interestingly, the study did not find significant evidence supporting the influence of awareness or customer experience on the level of comfort of using AI, contrary to what existing literature might suggest. This indicates potential gaps in consumer understanding of the technology or insufficient emphasis by banks in highlighting AI's benefits. Therefore, further research could explore alternative ways of raising awareness and improving customer engagement with AI tools.

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Appendices

Appendix A: Questionnaire for quantitative analysis

Start of Block: CSAT

Q1 Disclosure

Dear Participant,

Thank you for taking the time to participate in this survey, which is a crucial part of my master's thesis research at Católica Lisbon School of Business and Economics.

The focus of this study is the evolving role of AI in the banking sector, with particular attention to the factors influencing consumer acceptance of this new technology. The survey should take approximately 8 minutes to complete.

Your participation is entirely voluntary, and all responses will remain anonymous and confidential. The data collected will be used solely for academic research purposes.

If you have any questions or require further information about this survey, please feel free to contact me at s-rhidas@ucp.pt.

If you are willing to participate in the study, please provide your consent in the next step.

Thank you in advance for your time.

Best regards,
Réka Hidas

Q2 Do you consent to participate in this study?

- I consent (1)
- I do not consent (2)

Skip To: End of Survey If Do you consent to participate in this study? = I do not consent

Page Break

Q3 *In this questionnaire, I would like to explore your experiences with AI-driven banking services. Artificial intelligence (AI) in banking refers to the use of advanced technologies that enable computers and machines to perform tasks typically requiring human intelligence. These tasks include processing transactions, detecting fraudulent activity, offering customer support via chatbots, personalizing financial advice or automating loan approvals among*

others.

Q4 How frequently do you use social media?

- I do not use social media (1)
 - Less than once a month (2)
 - At least once a month, but less than once a week (3)
 - 1-2 days a week (4)
 - 3-5 days a week (5)
 - Daily (6-7 days a week) (6)
 - Multiple times a day (2 or more times a day) (7)
-


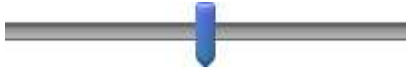



Q5 How frequently do you use e-banking services (Internet or Mobile banking)?

- I do not use e-banking services (1)
- Less than once a month (2)
- At least once a month, but less than once a week (3)
- 1-2 days a week (4)
- 3-5 days a week (5)
- Daily (6-7 days a week) (6)
- Multiple times a day (2 or more times a day) (7)

Skip To: End of Survey If How frequently do you use e-banking services (Internet or Mobile banking)? = I do not use e-banking services

Page Break

Q6 Please indicate your level of agreement with each of the following statements by selecting one of the options below:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I enjoy testing new technological solutions in my everyday life ()					
I receive sufficient information about the different AI-enabled technologies in banking services ()					
I receive sufficient information about the benefits of AI-enabled technologies in banking services ()					
I receive sufficient information on how my bank is using AI-enabled technologies in its services ()					
I never receive information about the usage of AI-enabled technologies in banking services ()					

Page Break

Q7 Please indicate your level of agreement with each of the following statements by selecting one of the options below:

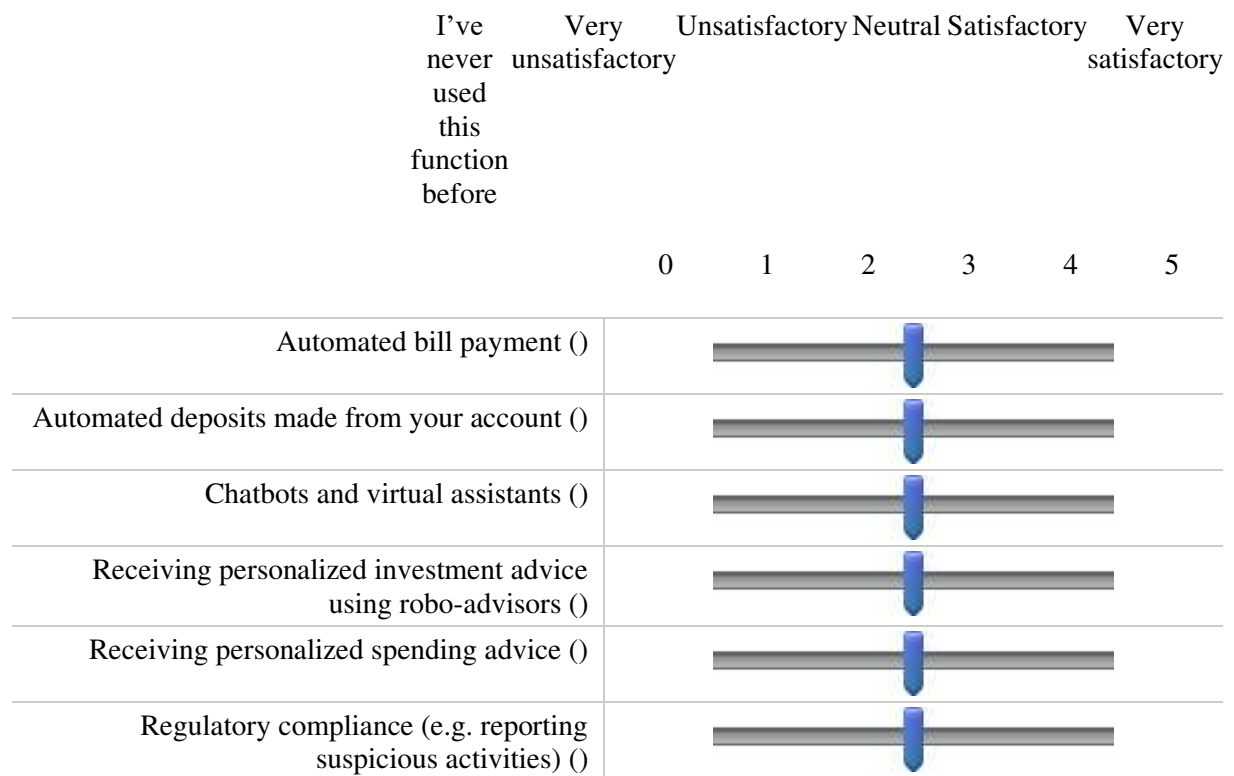
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
Banks use client’s personal data ethically ()					
My bank's mobile app and virtual interface are secure ()					
My bank's mobile app and virtual interface are reliable ()					
My bank's mobile app and virtual interface have good technical features ()					
The resources provided by my bank helps me to confidentially solve problems ()					
My bank's electronic security meets my needs. ()					

Q8 How confident are you in the security measures of AI-driven banking services?

- Not confident at all (1)
- Slightly confident (2)
- Moderately confident (3)
- Very confident (4)
- Extremely confident (5)




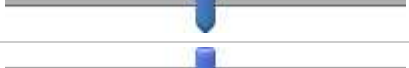



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Q9 For each of the following statements, please rate your overall experience with the following AI-enabled banking services:



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Q10 For each of the following statements, please rate your level of comfort with the **idea of using AI for the specified banking service**, whether it's based on your past experiences or how you imagine you might feel in the future:

	Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
	1	2	3	4	5
Using AI for paying bills ()					
Using AI for making deposits ()					
Having a conversation with AI enabled chatbots and virtual assistants ()					
Using AI for getting personalized investment advice ()					
Using AI for getting personalized spending advice ()					
Using AI for regulatory compliance ()					
Overall, how comfortable are you with banking using AI? ()					

Page Break

Q11 What is your gender?

- Female (1)
 - Male (2)
 - Other (3)
 - Prefer not to say (4)
-

Q12 What is your age?

- Under 18 (1)
 - 18-24 (2)
 - 25-34 (3)
 - 35-44 (4)
 - 45-54 (5)
 - 55-64 (6)
 - 65 or older (7)
-

Q13 What is your highest level of education achieved (graduated)?

- High school diploma or equivalent (1)
 - Associate's degree (2)
 - Bachelor's degree (3)
 - Master's degree (4)
 - Doctoral degree (5)
 - Other (7) _____
-

Q14 What is your primary occupation?

- Student (1)
- Employed full-time (2)
- Employed part-time (3)
- Self-employed (4)
- Unemployed (5)
- Retired (6)
- Other (10) _____

End of Block: Block 1

Appendix B: Guide for the focus group interview

Introduction:

- Introduction of the research, outline of the discussion process
 - There are no wrong answers; opinions and experiences are important. Cooperation and collaborative problem-solving will be needed.
- Ensure participants of anonymity

Introductory Questions:

The following questions aimed to test the general understanding of AI in banking and ease the participants into the discussion.

- Can you describe what comes to mind when you hear the term 'artificial intelligence' in the context of banking?

Main Topic:

1. Presentation of the survey, without further explanation, to ensure their judgment is impaired while filling out the survey.
2. After finishing the questionnaire, the discussion was led by the following questions:
 - Clarity of questions
 - Were there any terms or concepts in the survey that you found confusing or unclear?
 - Were the questions in each section easy to understand? If not, which questions did you find confusing, and why?
 - Response options:
 - Were there any options missing that you think should be included?
 - Relevance of questions:
 - Did the questions in the survey feel relevant to your personal experiences with banking?
 - Have you used any banking services that you believe are powered by AI?
3. Asking for feedback and suggestions:
 - Do you have any suggestions for improving the survey to make it clearer, more relevant, or more engaging?
 - Is there anything you would add or remove from the survey to improve its effectiveness?

Conclusion:

- Is there anything else anyone would like to add or comment on the topic?
- Thank you very much for your work and opinions, which have greatly helped my research!

Appendix C: Summary statistic table of all variables

<i>Variable</i>	<i>n</i>	<i>mean</i>	<i>sd</i>
Acceptance of AI services	119	3,168067	1,114765
Socialmedia_never	119	0,12605	0,33331
Socialmedia_weekly	119	0,067227	0,251473
Socialmedia_often	119	0,058824	0,236289
Socialmedia_daily	119	0,201681	0,402952
Socialmedia_moredaily	119	0,546218	0,499964
Awareness	119	2,219748	0,832248
Trust	119	3,420168	0,697947
Customer Experience	119	2,428571	1,120468
Gender_male	119	0,563025	0,498109
Age_18_24	119	0,294118	0,457572
Age_25_34	119	0,369748	0,484778
Age_35_44	119	0,092437	0,290867
Age_45_54	119	0,084034	0,278611
Age_55_64	119	0,159664	0,367843
Education_highschool	119	0,12605	0,33331
Education_assoc	119	0,02521	0,157426
Education_BA	119	0,344538	0,477227
Education_MA	119	0,504202	0,502096
Occupation_student	119	0,218487	0,414967
Occupation_fulltime	119	0,663866	0,474383
Occupation_parttime	119	0,07563	0,265524
Occupation_selfemployed	119	0,008403	0,09167
Occupation_unemployed	119	0,02521	0,157426
Occupation_retired	119	0,008403	0,09167

Source: Own representation

Appendix D: Linear Regression Model Assumption Tests

Durbin-Watson test result

<i>Statistic</i>	<i>P Value</i>	<i>Alternative Hypothesis</i>
1,84014448	0,12951403	true autocorrelation is greater than 0

Source: Own representation

Variance Inflation Factor (VIF) test result

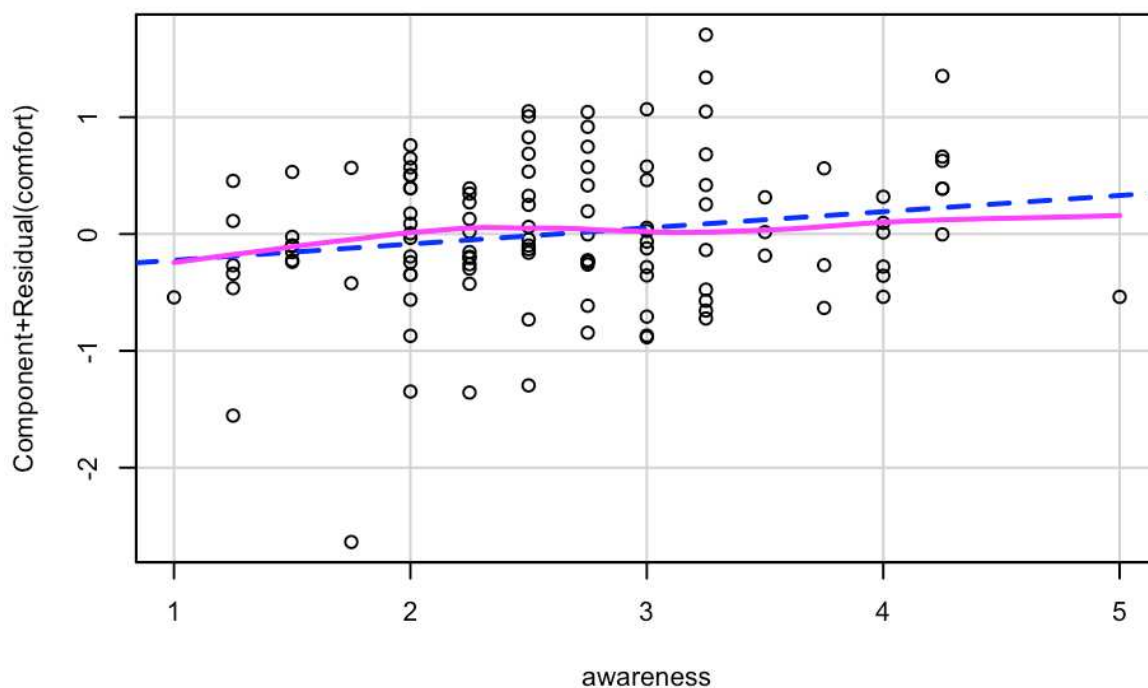
<i>Variable</i>	<i>GVI</i>	<i>Df</i>	<i>GVI^{1/(2*Df)}</i>
Awareness	1,52681863	1	1,235645026
Trust	1,41739689	1	1,190544785
Age	1,69752774	1	1,302892067
Customer Experience	1,63730867	4	1,063570591

Source: Own representation

Linearity test results

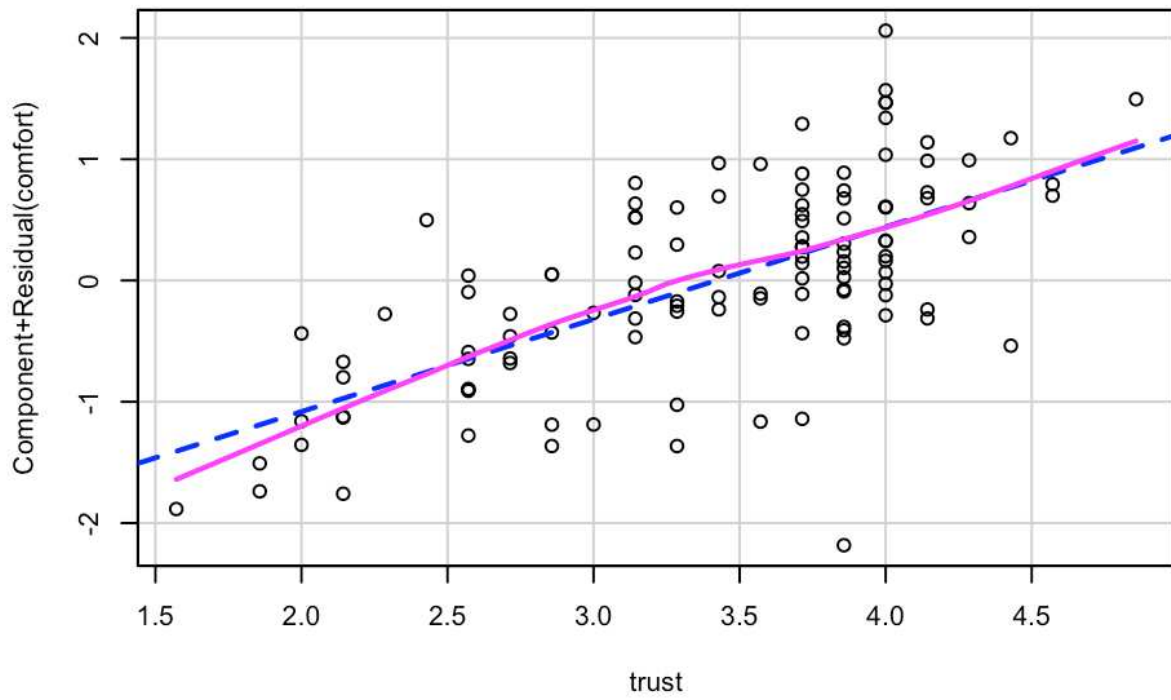
Partial residual plots:

1. Awareness variable



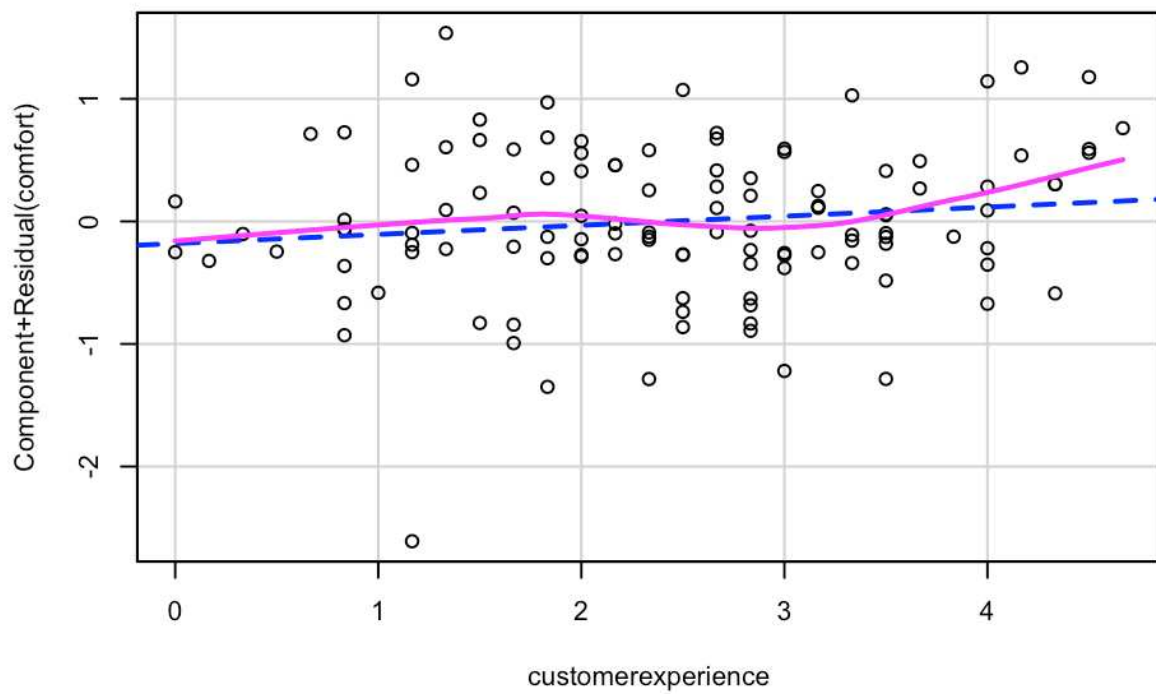
Source: Own representation

2. Trust variable



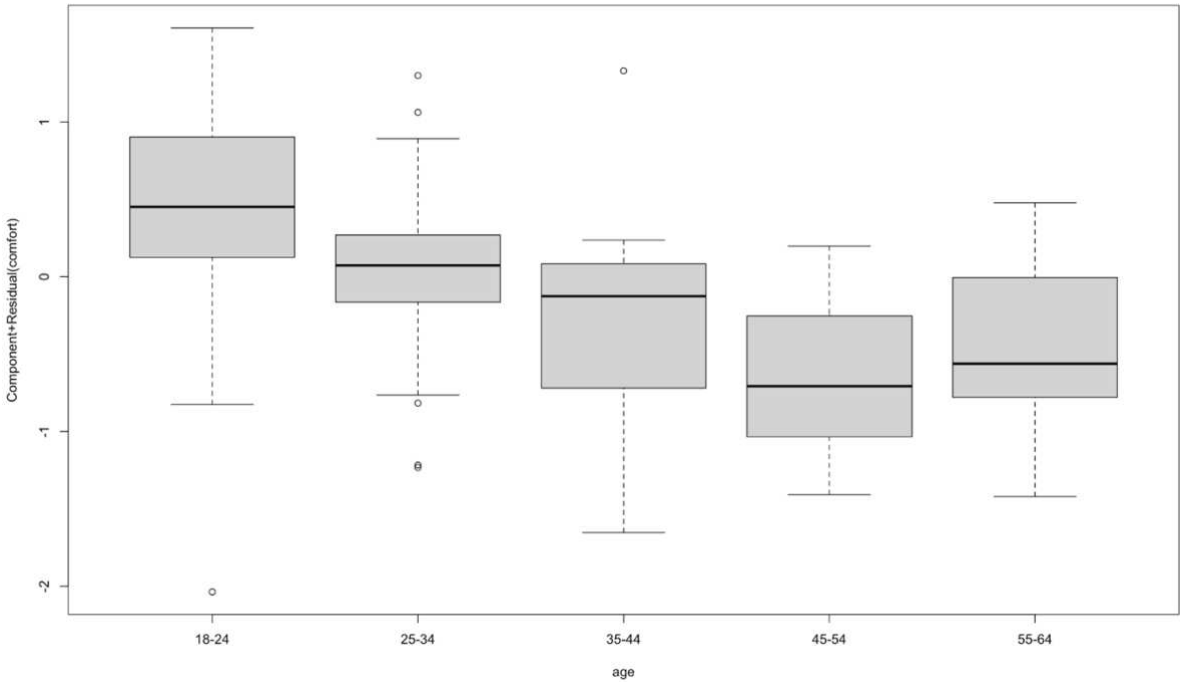
Source: Own representation

3. Customer Experience variable



Source: Own representation

Box plot – Age variable



Source: Own representation

Appendix E: Multiple linear regression model analysis output

Regression output of the used model– including the independent variables

	<i>Estimate</i>	<i>Std. Error</i>	<i>t value</i>	<i>Pr(> t)</i>
(Intercept)	0.56273	0.82402	0.683	0.49627
Awareness	0.13850	0.10420	1.329	0.18689
Trust	0.76153	0.11893	6.403	5.28e-09***
Customer experience	0.07435	0.07694	0.966	0.33628
Age	-0.82891	0.25252	-3.283	0.00143**

Observations: 119
Res. Std. Error: 0.6768 on 98 degrees of freedom
Multiple R-squared: 0.6939
Adjusted R-squared: 0.6314
F-statistic: 11.11 on 20 and 98 DF
Note: *p<0.1; **p<0.05; *p<0.01**

Source: Own representation

Regression output with all viable variables

<i>Variable</i>	<i>Dependent variable</i>
	acceptance
socialmedia_never	0.07 (0.38)
socialmedia_weekly	0.53 (0.35)
socialmedia_often	0.14 (0.35)
socialmedia_daily	0.24 (0.21)
ebanking_rarely	-0.83 (0.83)
ebanking_monthly	-1.30** (0.57)
ebanking_weekly	-1.16** (0.54)
ebanking_often	-1.00* (0.55)
ebanking_daily	-1.22** (0.57)
New technology testing_AW3	0.07 (0.09)
Information about AI_AW4	-0.32* (0.17)

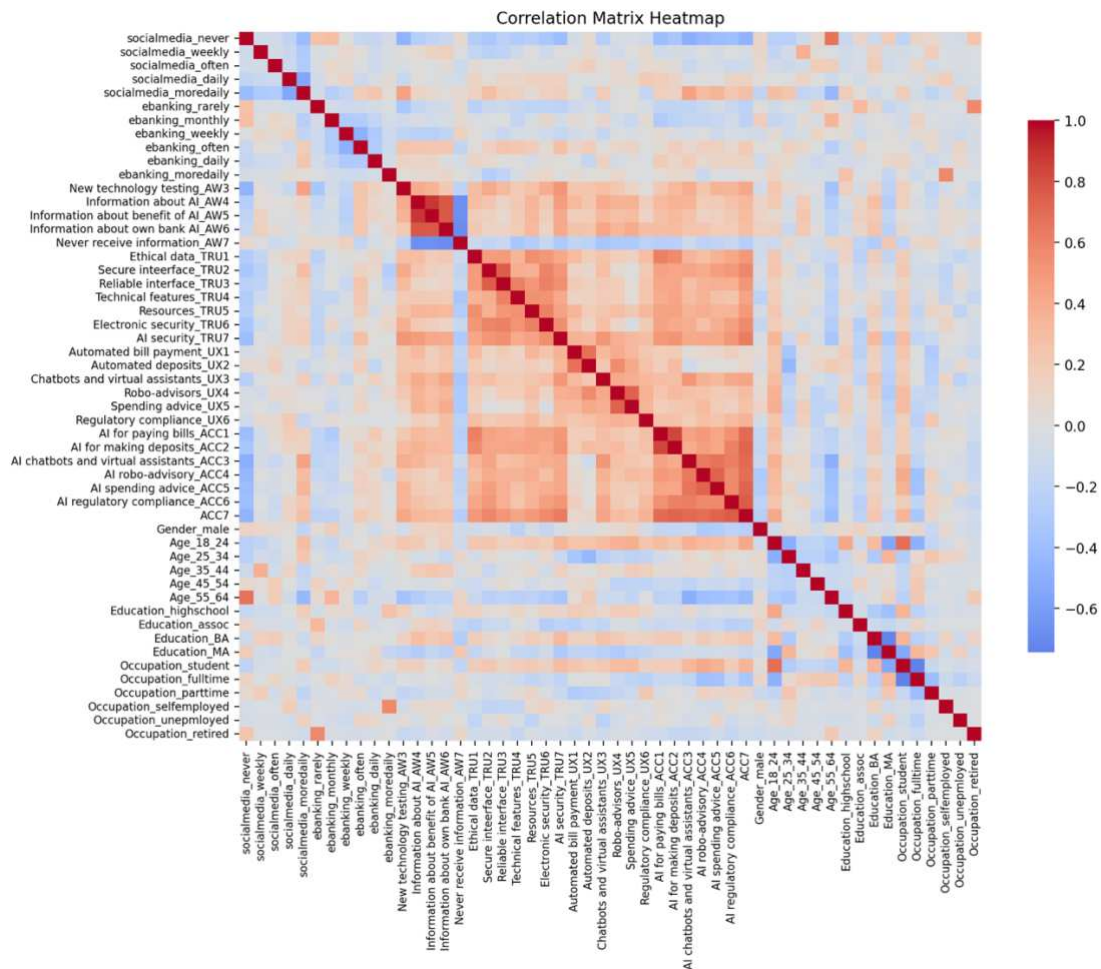
Information about benefit of AI_AW5	0.27 (0.16)
Information about own bank AI_AW6	-0.03 (0.12)
Never receive information_AW7	-0.04 (0.10)
Ethical data_TRU1	0.20** (0.09)
Secure interface_TRU2	0.37** (0.15)
Reliable interface_TRU3	-0.05 (0.17)
Technical features_TRU4	0.02 (0.12)
Resources_TRU5	0.03 (0.14)
Electronic security_TRU6	0.09 (0.14)
AI security_TRU7	0.19* (0.10)
Automated bill payment_UX1	-0.09 (0.07)
Automated deposits_UX2	-0.04 (0.07)
Chatbots and virtual assistants_UX3	0.16** (0.07)
Robo-advisors_UX4	0.02 (0.08)
Spending advice_UX5	0.05 (0.07)
Regulatory compliance_UX6	0.03 (0.05)
Gender_male	-0.41*** (0.15)
Age	-0.85*** (0.17)
Education_highschool	-0.74** (0.29)
Education_assoc	-0.44 (0.51)
Education_BA	-0.24 (0.21)
Occupation_student	0.81 (0.97)
Occupation_fulltime	0.49 (0.93)

Occupation_parttime	0.78 (0.95)
Occupation_selfemployed	-0.24 (1.28)
Occupation_unemployed	0.44 (1.07)
Constant	0.62 (1.39)

Observations: 119
R-squared: 0.79
Adjusted R-squared: 0.68
Residual Std. Error: 0.63 (df = 78)
F Statistic: 7.24* (df = 40; 78)**
Note: *p<0.1; **p<0.05; *p<0.01**

Source: Own representation

Correlation matrix with all viable variables



Source: Own representation