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BEING AT THE CUTTING EDGE OF INTERNET BANKING:

The role of privacy perception and the consumer determinants of intention to adopt artificial intelligence technologies

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Dissertation

presented as partial requirement for obtaining the Master Degree Program in Information Management

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BEING AT THE CUTTING EDGE OF INTERNET BANKING: THE ROLE OF PRIVACY PERCEPTION AND THE CONSUMER DETERMINANTS OF INTENTION TO ADOPT ARTIFICIAL INTELLIGENCE TECHNOLOGIES

By

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledge the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisbon, November 12, 2022

DEDICATION

Aos meus pais.

Por me terem deixado sempre voar até onde quis.

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"The real voyage of discovery consists not in seeking new landscape, but in having new eyes."

ABSTRACT

The emerging progress of the industry 4.0 and FinTech companies had repercussions, starting a new investment wave in digitalization for banks and financial companies that, investing in modern technologies that improve financial products, services, and processes. Artificial intelligence technologies are one of the cases that emerged rapidly within financial services. These technologies are used for a better user-bank relationship improving the impact regarding solutions, such as digital money management tools. Even though nowadays customers are now used to internet banking, AI applications and the concerns regarding data privacy can impact the intention to adopt these new solutions and technologies. Therefore, it is crucial to understand the main determinants of intention to adopt, risk, and benefit perceptions regarding emerging banking technologies. In response, an experiment was developed to understand and explain the consumer's intention to adopt AI tools in internet banking, by investigating the influence of privacy and risk perception on the intention to adopt the technology. Participants were randomly exposed to one of two introduction videos: the basic and the exaggerated one. To run the experiment, we collected data using a questionnaire and performed two studies – one with 132 respondents and another one with 155. Although the results prove that the videos had no impact on the risk and privacy perception, our results support some relationships of decomposed theory of planned behavior. To explain the intention to adopt the technology, attitude towards adopting and perceived behavioral control are the key factors. The implications of this research for companies and consumers are discussed.

KEYWORDS

Internet Banking; Artificial Intelligence; Digital Money Management; Consumer Behaviour; Intention to Adopt; Decomposed Theory of Planned Behavior; Perceived Risk: Perceived Privacy

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LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial intelligence
ATM	Automated teller machine
ANOVA	Analysis of variances
DFAS	Digital financial advice solutions
DOI	Diffusion of innovation
DTPB	Decomposed theory of planned behavior
FinTech	Financial technological companies
TPB	Theory of planned behavior
TRA	Theory of reasoned action
UTAUT	Unified theory of acceptance and use of technology

1. INTRODUCTION

The digital business growth and the internet expansion impacted banking and financial enterprises need to digitalize their processes, by offering new services and products that could satisfy their customers and transfer their in-person point-of-sales to new digital platforms. The impulse and the new wave of internet platforms created the internet banking phenomena (Mirković et al., 2019). The internet banking started to represent a significant channel for consumers, being the chosen place to invest in innovation, such as data management, cloud computing, or supply chain (Jünger & Mietzner, 2020; Sangeetha et al., 2022; Vinoth et al., 2022). As found by Chau & Lai (2003) in their research about the determinants of internet banking acceptance, besides personalization and functional platforms that cross different services, financial planning services are a valuable asset for internet banking and their users, by increasing their banking platforms' usefulness. Therefore, financial institutions have started to invest in artificial intelligence (AI), creating different services that give new insights to customers by processing in-depth data analysis (Peng et al., 2022) regarding their financial assets, transactions, and investments. The objective is to help customers to manage their finances and perform banking transactions with meaningful information, obtained by data algorithms and discovered patterns (Howcroft et al., 2010) that combine statistical and analytical techniques to extensive volumes of data to predict future behavior or events (Finlay, 2014; Nyce, 2007).

Although such technologies can be promising, previous literature stated that customers perceive internet banking services as riskier than traditional banking services (Martins et al., 2014). Furthermore, previous research that studied how consumers perceive AI technologies proved that perceived risk has a significant impact on the adoption and acceptance of these technologies (Hasan et al., 2021; Nizioł, 2021), which can negatively affect the adoption decision.

There is a lack of studies that apply AI and digital banking associated with customer intention to use it. To the best of our knowledge, this is one of the first studies focusing on understanding how customers perceive AI in the digital banking industry as a user-related tool. The more knowledge we create regarding this topic, the more success it will have. Having in mind the research gap, further investigation needs to understand what drives customers to adopt AI banking technologies, what they think about these technologies, their concerns, and what they perceive as advantages. Therefore, two key research questions were developed for this process as follows:

RQ1:	Do customers have the intention to adopt artificial intelligence technologies in internet banking?
RQ2:	How does benefit, trust and risk influence the intention to adopt artificial intelligence in internet banking?

Table 1 – Main research questions

This study proposes an experimental approach that includes a privacy calculus by exposing the respondents to one of the videos used, combining the decomposed theory of planned behavior

(DTPB) by Taylor & Todd (1995) and the personal innovativeness concept by Rogers et al. (1971) to explain customers' intention to adopt AI technologies in internet banking.

The present research is structured as follows: firstly, in section 2, a review of prior research will be conducted, exploring relevant information regarding the research topic. Section 3 will specify the proposed model and respective hypotheses to explain what we intend to evaluate, with the defined method and measures explored in section 4. To conclude, the obtained results will be presented in section 5, as the conclusions in section 6, ending with limitations and future research directions for future investigation intended to inspire and support the expected evolution of the present research.

2. LITERATURE REVIEW

2.1. THE CONCEPT OF INTERNET BANKING

Over the past years, the internet growth has changed thousands of processes, demanding the transformation of traditional businesses into more sophisticated services and products (Bankewitz et al., 2016; Mirković et al., 2019). The digital transformation has brought several benefits, regardless of the activity sector: companies established innovation as a priority to amplify their coverage with convenient solutions that allowed them to acknowledge customer needs, increasing the number of customers using digital channels that helped to manage costs (Xue et al., 2011). Concerning the continuous innovation and urgent need to create convenient data and products for consumers, information systems and industry 4.0 became crucial in multiple industries, such as the banking sector (Seese et al., 2008). Accordingly to Jünger & Mietzner (2020), "the past decade has seen the rise of digital advisory and trading systems" which helped banks to realize the implementation of new tools and practices represented a growth opportunity.

At the same time, the growth of financial startup companies (FinTech) became a risk for digital transformation. These small enterprises and businesses stepped into the market as agile and innovative players (Filotto et al., 2021), with the advantage of being created under the technological demand and having less obligations towards financial authorities, such as Central Banks or National Banks. These benefits enabled FinTech to stand for a change in the financial markets, which differentiated them from traditional banks with up-to-date and simple financial services and products, attracting younger and more innovative customers from traditional banks with innovative and flexible solutions (Augusto & Torres, 2018). To face the contest between innovative offers and increase their convenience, banks developed internet banking. Accordingly to Zalloum et al. (2019), internet banking is one of the most well-recognized ways of banking innovation and, nowadays, is one of the most privileged banking channels. It is a banking service employed through the internet that allows banks to offer products (Lee, 2009) and give customers the capability to perform transactions electronically, without a third-party interaction. As a result of the high convenience, the adoption of internet banking became familiar, and banks found a new way to increase revenues, improve their competitive advantage, and attract new customers (Dudić et al., 2018; Liao & Cheung, 2002).

Among the extensive literature about banking innovation, internet banking platforms stand out, regarding the customer intention to use, adopt, and accept (Garg et al., 2021). Prior research states that the banking industry's complexity generated a reluctance to adopt this channel, where customers feared a negative interaction (Gouveia et al., 2020), presenting different objections to the acceptance. Sathye (1999) on internet banking adoption by Australian consumers found that a significant percentage of the participants had security concerns. 68% of the respondents were not informed about the offers and benefits, having 40% declaring that the usage difficulty was the reason for non-adoption. 55% pointed out that "unreasonable price" was why they did not adopt this service when this type of service was and still is free. Some respondents cited "resistance to change" as the reason for not adopting the internet. Martins et al. (2014) investigated the acceptance and risk perception of internet banking in Portuguese students and ex-students from a University and found that consumers were not concerned about the environment but the outcomes and the required effort to use it. Despite

the usage increase and adoption of internet banking, some consumers are still reluctant to adopt new banking services and features due to perceived risk and perceived privacy (Lee, 2009).

Recently, there was an increase in internet banking adoption: banks registered a proliferation of internet banking due to the pandemic that triggered the need for a convenient service (Chatterjee et al., 2022). Hence, banks joined internet banking to industry 4.0 innovative concepts, creating different tools to operationalize transactions with distinctive and personalized offers, adapting themselves to the technological demand, investing their resources in innovation, and helping customers to increase their loyalty. Examples of the several products, services, or features delivered by banks to create new solutions for traditional services are big data applications in credit risk evaluation (Wen et al., 2021), digital financial advice solutions (DFAS)[1] (Gerlach & Lutz, 2021), or chatbots (Bose et al., 2013). These innovations are not only focused on internal process improvement but also on offering consumers new digital experiences in distinct channels, giving them the ultimate decision onus for real user experience and interaction with their banks.

2.2. FINANCIAL PLANNING BEHAVIOR

The digital evolution allowed a one-to-one relationship, providing personalized services for consumers to know more about their finances. Chau & Lai (2003) and Papathanassiou (2004) researched the determinants of user acceptance of internet banking and the customization approaches and opportunities in the financial sector and found that beyond giving personalized information, banks need to include in their offer financial planning and management services to help their customers their financial management with detailed and convenient data. In her empirical investigation of mobile banking adoption, Lin (2011) found that to progress to a digital banking environment that meets consumer needs, banks should create practical solutions and functionalities such as “intelligent agent-based portfolio management and financial planning services”. When it comes to analyzing the importance of internet banking, financial planning plays an important role.

Financial planning is a broad topic and can be described as the developed strategies to manage goal-oriented financial assets (Chieffe, 1999) that include different habits, such as budgeting, insurance, retirement planning, and savings (Jargalsaikhan et al., 2019). It can be affected by several factors, such as beliefs and behaviors as a source of anxiety (Grable et al., 2015; Peterson & Miller, 2019). The specific topic that explores anxiety in this field is denominated financial anxiety and can be described as a reaction to a financial situation” (Peterson & Miller, 2019). When this research was written, the American Psychological Association pointed out this factor as the main reason for stress in the United States of America.

Different research has explored the importance of financial literacy and planning (Lusardi & Tufano, 2015; van Rooij et al., 2011). Murphy & Yetmar (2010) found in their study that although 75.7% of the participants admitted that personal planning is a significant practice, only 67% were interested in the field, and 33% believed to “have the skills and knowledge to prepare a personal financial plan”. Curiously, from 68 responses, 47 indicated that they had accounting or finance job positions, which means that more than half of the respondents who believe to have enough knowledge about personal

[1] DFAS, also known as “robot advice” or “robot advisory” are solutions that provide advice on investment proposals with algorithms and minimum human intervention in the advisory process, helping the user with the required parameters for the investment, such as monetary values, or risk calculation (Gerlach & Lutz, 2021).

finances have experience in the field. When asked if they would develop their financial plan or seek particular advice, 74% admitted to seeking advice.

Financial planning behaviors are still ingrained habits that represent an obstacle to financial planning due to a lack of knowledge or difficulty in dealing with finances. While consumers try to become aware of their financial needs, there is a real need to learn about this topic or to create new financial habits (Tomar et al., 2021; Weishaar et al., 2019). Hence, internet banking AI technologies for financial planning represent a possible way to seek for personal advice. These technologies have the possibility to become a competitive advantage.

2.3. THE CONCEPT OF ARTIFICIAL INTELLIGENCE

Although AI has been widely explored, it might be hard to define. Analyzing the literature, AI is described as a system that interprets large amounts of external data obtained by several distinct methods (Internet of Things or big data), learns from it, and uses those learnings for specific tasks and goals in a flexible and agile way (Kaplan & Haenlein, 2019). McCarthy et al. (2006) described AI as the process of "making a machine behave in ways that would be called intelligent if a human were so behaving".

The advantage of AI and similar disruptive technologies lies in the predictive and dynamic environment with the capacity for self-learning, integrating a high-security level that protects large amounts of data (Zhao, 2022). AI can bring new opportunities to the banking sector that might increase the companies' robustness and motivation to transform their processes, operations, and structure (Wall, 2018), as well as improve the banking results (La Torre et al., 2021). As explained by Rodrigues et al. (2022), banks and financial companies needed to incorporate AI into new solutions for customer insights for the fastest, easiest, and most inexpensive banking experience (Kumar & Kalse, 2021; Syam & Sharma, 2018), using computer systems and machines with a predictor behavior (Agrawal et al., 2019; Mahalakshmi et al., 2021).

According to Mahalakshmi et al. (2021) and their study about the implementation of AI and machine learning in the financial services industry, AI helps to forecast the market behavior, prevent fraud, and protect the data against risk insights and trends, improving the banks' efficiency with real-time information. Königstorfer & Thalmann (2020) stated that banks should invest in AI for their coverage in different core business areas, helping to make accurate predictions using different data types. There are still few financial companies that offer this type of solution. Nevertheless, it is a promising improvement that helps customers to manage their finances with advanced information

2.4. ADOPTION BEHAVIOR MODELS

As demonstrated previously, the acceptance and use of banking technologies have been a research subject, where several theories bring different overviews to this research field. The main theories and their respective studies can be found in table A of the appendix.

One of the most well-known theoretical models used to explain consumer acceptance and use of technologies is the extended unified theory of acceptance and use of technology (UTAUT) by Venkatesh et al. (2012). Formed under eight different models (Venkatesh et al., 2003), this theory

postulates that seven constructs - performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit - determine the behavioral intention and use behavior. This theory has been widely used in literature to understand technology acceptance and use, as Zhou et al. (2010) undertook to discover internet banking adoption and Andrews et al. (2021) tried to understand the librarians' intention to adopt AI and related technologies. Although this model has been used to explore topics similar to the one under analysis, we intend to focus on consumer behavior traits, being the primary reason for not using this model in the present research.

It is crucial to understand if the consumer has the intention to adopt these innovations and scrutinize consumer-related traits about the research topic. Therefore, one of the theories used to pursue the research questions is the DTPB by Taylor & Todd (1995).

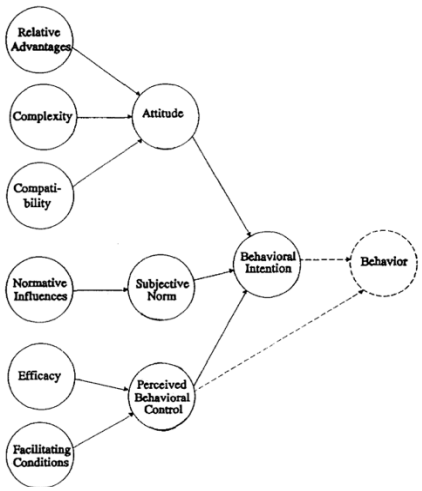

Figure 1 - Decomposed theory of planned behavior model

The DTPB represents a decomposition of the theory of planned behavior (TPB) by Ajzen (1991). In turn, the TPB is an extension of the theory of reasoned action (TRA). Those theories help to understand how an individual can perform behaviors. As the TRA and TPB postulate that "behavior is a direct function of behavioral intention" the DTPB provides an extensive understanding of behavioral intention compared to other theories. Since the inception of the DTPB, researchers have tested the model to explain behavior and intention behavior topics (Al-Majali & Nik Mat, 2010; Jouda et al., 2020). As an example, Kazemi et al. (2013) analyzed the factors that affect mobile banking adoption and found that attitude and perceived behavioral control are important for predicting mobile banking adoption. Shaikh et al. (2021) explored the customers' acceptance of financing and found that it is determined by the subjective norm, attitude, and perceived behavioral control.

Another theoretical model that is also widely used in the previous literature is the diffusion of innovation (DOI) by Rogers et al. (1971). The DOI theory examines the success of innovations through the consumer behavior lens, deciding their adoption behavior. Since its inception in 1971, researchers have tested this theory, publishing investigations that, for example, examine the factors that affect the intention to adopt mobile banking (Ho et al., 2020) or a pharmacy residency program implementation through the DOI theory (Wang et al., 2021). Yi et al. (2006) stated that personal innovativeness from the DOI theory is "the willingness of an individual to try out new IT" as it "plays an important role in

determining the outcomes of user acceptance of technology". Previous research (Oliveira et al., 2016; Yi et al., 2006) shows that personal innovativeness, initially considered a moderator, became a determinant of perceived ease of use and perceived usefulness. As stated by Kazemi et al. (2013), personal innovativeness varies depending on the individual, as some may adopt more innovative technologies while others are more reluctant due to perceived risks.

2.5. MOTIVATION

Cofer & Petri (2020) stated that motivation is the "forces (…) to initiate a behavior". Our experiences and daily activities involve utilitarian and hedonic motivations, and previous literature explored different perspectives of these motivations, such as the motivation in shopping experience (To et al., 2007), customers evaluations of shopping malls (Allard et al., 2009), or the motivation behind the consumer acceptance and use of a technology (Venkatesh et al., 2012).

Utilitarian motivation is the "mission-critical, rational, and goal-oriented" (Batra & Ahtola, 1991; Hirschman & Holbrook, 1982). It is associated with tasks, goals, and the benefits depending on the task results - if accomplished efficiently, then the motivation will increase (Babin et al., 1994). Contrastingly, hedonic motivation can be described as "the fun or pleasure derived from using a technology" (Venkatesh et al., 2012) and can bring happiness, enjoyment, or excitement from the experience, being the motivation that describes how one can feel by performing a specific behavior (To et al., 2007).

Putting both types of motivation aside, the hedonic reason why individuals love an innovation is that they enjoy using it, while the utilitarian reason loves the same innovation because they can perform their tasks. As Dhar & Wertenbroch (2000) and other studies argued, hedonic and utilitarian motivations impact consumer behavior in different ways and levels, where hedonic and utilitarian motivation have become "an emerging factor in maintaining competitive advantage" (Parsons, 2002; To et al., 2007). Some examples of previous literature regarding motivation and its integration with banks are Jamshidi et al. (2018) who found that hedonic and utilitarian motivation influence the mobile banking experience; Mäenpää et al. (2006) found that hedonic customers believe in every product that might be launched in the market, although they might not be the target for banks and utilitarian customers are the preferable target, although they prefer simpler services and offers; Kim & Han (2011) who analyzed the role of hedonic and utilitarian values in mobile data services found that only utilitarian values determine the intention to adopt the mobile services.

2.6. PRIVACY CALCULUS

Literature has explored the privacy concerns and benefits regarding technology adoption, exploring different effects to understand what ceases consumers to innovation adoption. One of those terms is privacy calculus: a representation used to explain a "cognitive/mental evaluation that weights privacy costs and benefits" helping to explain why customers intend to use specific innovations despite privacy concerns (Distler et al., 2020; Venkatesh et al., 2021). This calculus analyzes inhibitors and enablers to measure their effects in determining a decision behavior. In this research, the privacy calculus is used to examine the customers' cost-benefit regarding risk and privacy. Four variables will compose the privacy calculus: perceived benefit, consumer trust, perceived risk, and perceived privacy.

2.6.1. Perceived risk

Ostlund (1974) brought to the literature the term "perceived risk" as a negative connotation for the consequences of consumer actions in the consumer behavior field. Featherman & Pavlou (2003) defined perceived risk as “the potential for loss in the pursuit of the desired outcome of using an e-service”. This is one of the most impactful factors that affect the adoption of new technologies and it has been analyzed by different authors (Bauer, 1967; Luo et al., 2010). This research formulated one of the most used risk theories, identifying seven different types of risk: performance, financial, time, psychological, social, privacy, and overall risk.

Regarding the digital banking, the financial sector was not an exception, feeling the challenges of low trust levels, being perceived as a significant risk (Vance et al., 2008). In their research about e-services adoption, Liao & Cheung (2002) found that risk highly affects e-services adoption, being considered a purchase and adoption inhibitor. Luo et al. (2010) also mentioned that individuals who do not believe in mobile banking technologies tend to perceive higher risks in financial transactions and will not embrace innovative technologies in the early stages. Littler & Melanthiou (2006) found that the participants expressed their concerns about security risks, considering the internet as unsafe and mentioning "hackers" as a risk vehicle. Non-users of internet banking that took part in the study revealed how concerned they were about the possibility of losing money through a transaction and the risk perception of not having direct contact with bank members that could help them if needed. Shaikh et al. (2020) found that performance expectancy is the main factor in understanding mobile banking acceptance and risk perception "is a salient antecedent to innovative technology acceptance", reducing the intention to adopt mobile banking.

As we can learn from these examples, internet banking users face several traits that impact the decision process of technology adoption.

2.6.2. Perceived privacy

Using private and sensitive information to have stable value for technology can be a concern to the users by negatively influencing two relevant perceptions - risk and privacy (Prabhu et al., 2019). As we have seen previously, internet banking technologies have changed how individuals use and move money, since it became a type of transaction data stored in a mobile device and moved as e-cash. By becoming a fundamental element of our society, it changed the way personal financial information is used, the way people interact with financial institutions, and the willingness to perform specific behaviors: those who have privacy concerns about their privacy protection tend to have lower intention to adopt, use, or purchase online (Malhotra et al., 2004). To understand how privacy concerns can affect the intention to adopt the technology, the construct perceived privacy will be used as the belief that the entity that will use their information will protect it during any transaction and from any trait (Kim et al., 2008).

George (2004) mentioned that privacy concerns are often pointed as one of the key reasons consumers do not make online purchases and, transposing this fact to AI banking technologies, privacy concerns might also be one of the key reasons consumers have low intentions to adopt it. Njenga & Ndlovu (2012) researched the concerns that influence mobile banking subscriptions and found that perceived benefits had more influence than perceived risk, having a lower knowledge of security

concerns as the determinant of the results. Also, the study revealed that the higher the perceived utility of mobile banking, the more disallowed perceived privacy and perceived security concerns. Culnan (1993) found that people that are less aware of the use of secondary personal information have more positive attitudes towards a specific technological use of personal data "and have a lower concern for privacy measured as a loss of control" than the opposite group.

2.6.3. Perceived benefit

Regarding the topic of the research, a perceived benefit can be explained as the users' belief that the use of AI technologies in digital banking to manage their finances implies advantages, bringing positive outcomes to the management habit/action (Benlian & Hess, 2011; Kim et al., 2009; Ryu, 2018). In the privacy calculus, perceived benefit represents one of the enablers. When Peter & Tarpey, Sr. (1975) analyzed the consumer decision strategies, they stated that regarding brand preferences, perceived benefit and perceived risk significantly affect the decision-making process.

Previous research on the opportunities and risks in internet banking adoption decisions found that perceived benefits have the opposite effect of perceived risk and can be a trade-off element to balance the risk perception (Distler et al., 2020). When a consumer perceives benefits and opportunities, they will have a higher intention to adopt than an individual who perceives risks (Benlian & Hess, 2011). Alalwan et al. (2018) researched about what influences customers to adopt internet banking and stated that customers who easily find internet banking beneficial are more likely to perceive internet banking as a valuable system. They also found that customers are open to using internet banking if the performance and their hedonic motivations are satisfied with online transactions and banking interactions.

2.6.4. Consumer trust

Many digital platform users need to trust the providers to overcome their personal information perceived risks (Hoffman et al., 1999). Trust can be described as a determinant of a positive relationship but also a critical component (Jarvenpaa et al., 1997) reflected in the willingness to perform banking transactions without observing them (Mayer et al., 1995; Zalloum et al., 2019). Trust plays a dominant role regarding unknown risks of using the internet. It represents a sensitive issue for banks on their duty to safeguard security, improvement, and safety assurance to their customers (Anton, 2014; Bhattacherjee, 2002).

Since consumers do not know the threats they can find when using internet banking platforms, they need to trust the products, services, and brands to overcome risk perceptions (Luo et al., 2010; McKnight et al., 2002; Vance et al., 2008). Pavlou (2002) found that trust plays an important role, being statistically significant regarding the attitude towards online shopping and perceived behavioral control. Mukherjee & Nath (2003) found that trust positively influences customers' commitment, where privacy and security are determinants of customers' trust. Among several findings, this research confirmed that trust affects customers' commitment to adopt internet banking. George (2004) found that trust on the internet is more important than privacy data concerns. They also found that the respondents and internet users who trust the internet and their abilities to use it have a higher engagement in the behavior under analysis.

3. RESEARCH MODEL

As internet banking hinges upon new technological transformations, financial institutions develop new products and services that allow consumers to use cutting-edge technologies. One of the examples, as mentioned before, is to use of AI to help internet banking consumers to manage their finances. Focusing on the research questions initially proposed, a survey was created, having the following structure and hypothesis.

In the early stages of the survey, we presented a technology description (TD). This section provided a video to introduce the AI technology in internet banking, describing how it would work and the benefits of using it as a money and financial products manager. The video had two versions. The second version had the same logic and a similar text, being exaggerated by adding concepts to the text related to personal data, such as “use customers transaction data” or “giving suggestions and help based on inputs from consumers' profile”. The proposition of having an exaggerated version for the introduction is to understand if respondents under the condition of being exposed to data privacy and risk topics would have a different intention to adopt AI innovations in internet banking platforms. Survey respondents were exposed randomly to one of the videos, creating two groups of respondents: the ones who answered under an exaggerated effect and those who responded the survey under no exaggerated effect.

The second part of the research model relied on the literature findings. As explained previously, according to the DTPB by Taylor & Todd (1995), three constructs are determinants of the intention to adopt behavior: attitude towards, adopting, perceived behavioral control, and subjective norms. Normative influence is the belief that other peoples' opinions are important, regarding the decision to adopt a technology, and subjective norms are the perception of the social pressure to act accordingly to an expected behavior (George, 2004). Since the AI internet banking tools to manage personal finances are not usual in the market, which results in a general lack of information about this technology, normative influence, and subjective norms constructs will not be considered in this research. Relative advantage is “the degree to which an innovation provides (…) such as economic benefits, image enhancement, convenience and satisfaction” (Rogers et al., 1971; Taylor & Todd, 1995). There are not enough innovations similar to the one under analysis, representing a lack in terms of comparison. Therefore, this construct will not be included in the research model. Hence, complexity, compatibility, self-efficacy, facilitating conditions, attitude towards behavior, and perceived behavioral control were the constructs selected for the research model. Each of the constructs will be explained below.

Complexity (C) describes the degree to which an individual perceives innovation as though to learn and use (Rogers et al., 1971; Taylor & Todd, 1995). Generically, some innovations might be easier to understand while others are complex and imply more. The degree of complexity can highly affect adoption decision, being crucial to analyze this construct in cutting-edge innovation. Compatibility (CM) was found as a relevant construct that measures, according to Rogers et al. (1971), the degree to which an innovation suits the values, experiences, and needs of an individual. It is expectable that compatibility adopts a positive behavior towards the intention to adopt an innovation. On the other side, if innovations are perceived as incompatible with specific values and needs, it probably will not be adopted. Consecutively, attitude towards adopting (ATA) is similar to the belief that an attitudinal behavior, according to the authors Taylor & Todd (1995), will lead to an outcome “weighted by an

evaluation of the desirability of that outcome". It means that the final result of behavior will be evaluated in comparison to the expected result. It is expected that ATA will have a positive influence on the intention to adopt (IA) the technology (Taylor & Todd, 1995), creating the following hypothesis:

H1: The description of the technology (DT) will negatively influence complexity (C).

H2: The description of the technology (DT) will negatively influence compatibility (CM).

H3: Complexity (C) will negatively influence consumers' attitude towards adopting (ATA).

H4: Compatibility (CM) will positively influence consumers' attitudes towards adopting (ATA).

H5: Attitude Towards Adopting (ATA) will positively influence consumers' Intention to adopt (IA).

Self-efficacy (SE) is a construct explored by Bandura (1977), who explained that it has influence by expecting eventual success, as it determines how much effort an individual needs to face the obstacles. Hence, if an individual feels comfortable using AI innovations in digital banking, they intend to adopt them (George, 2004; Taylor & Todd, 1995). Facilitating conditions (FC) are the resources needed to use an innovation, such as money, time, or technology. If a consumer disposes of the necessary conditions it leads to adjustments in the intended behavior, increasing the intention to adopt it (Taylor & Todd, 1995). Therefore, perceived behavioral control (PBC), according to Taylor & Todd (1995), is the ability and perception that a consumer has internal and external resources to perform a specific behavior. We expect that perceived behavioral control (PBC) will have a positive influence in consumers' intention. Therefore:

H6: The description of the technology (DT) will negatively influence self-efficacy (SE).

H7: Self-efficacy (SE) will positively influence consumers' perceived behavior control (PBC).

H8: Facilitating conditions (FC) will positively influence consumers' perceived behavior control (PBC).

H9: Perceived behavioral control (PBC) will positively influence consumers' intention to adopt (IA).

Two other constructs are hedonic motivation (HM) and utilitarian motivation (UM). As explained previously, hedonic motivation is a more personal and subjective value being the enjoyment and excitement of using an innovation. In this research, we expect that the effect of hedonic motivation positively impacts the intention to adopt as it plays an important role during the first stages of interaction with it (Kim & Han, 2011; Venkatesh et al., 2012). Therefore, we hypothesize that:

H10: The description of the technology (DT) will negatively influence hedonic motivation (HM).

H11: Hedonic motivation (HM) will positively influence consumers' intention to adopt (IA).

Utilitarian motivation (UM) is associated with practicality, effectiveness, and efficiency (Kim & Han, 2011), as the ability of an innovation to accomplish the needed task (Babin et al., 1994). As stated in hedonic motivation, we expect that utilitarian motivation positively impacts the intention to adopt the innovation as a vehicle to help consumers to accomplish their financial management tasks or needs (Allard et al., 2009).

H12: The description of the technology (DT) will negatively influence utilitarian motivation (UM).

H13: Utilitarian motivation (HM) will positively influence consumers' intention to adopt (IA).

Personal innovativeness (PI) represents the trait of an individual who shows willingness to try innovations. Accordingly to Yi et al. (2006), the higher the level of personal innovativeness, the greater the intention to adopt an innovation, feeling more compatible and capable to use the technology also becoming more willing to recognize benefits (Oliveira et al., 2016). Hence:

H14: Personal innovativeness (PI) will positively influence consumers' intention to adopt (IA).

Weighted privacy and benefits can influence our intention to adopt AI tools in internet banking. Starting with perceived risk (R) and perceived benefit (PB), previous research states that benefits and risks have an impact on the adoption decision, having the intention to adopt being strongly impacted by the benefits, while risks impact the behavior negatively (Benlian & Hess, 2011). Also, it is confirmed that perceived benefit has a positive impact on usage behavior (Kim et al., 2008) and that these hypotheses maintain their effects in a continuous usage intention (Ryu, 2018). Hence:

H15: Perceived risk (R) will negatively influence consumers' intention to adopt (IA).

H16: Perceived benefit (PB) will positively influence consumers' intention to adopt (IA).

H17: The description of the technology (DT) will negatively influence perceived risk (R).

H18: The description of the technology (DT) will negatively influence perceived benefit (PB).

Perceived privacy (PP), as mentioned, is the belief that personal information is protected (Kim et al., 2008). Banks deal with different data from their clients, from personal to transactional data. This information can represent an easy target for fraudulent use. To many consumers, having their privacy unprotected can represent a major concern. As mentioned by Kim et al. (2008), since this is becoming a matter of public interest, consumers sense that companies should not share their private information - if one perceives that their data is protected, they will perceive a lower risk. The argument suggests that:

H19: Perceived privacy (PP) will positively influence consumers' perceived risk (R).

H20: The description of the technology (DT) will negatively influence perceived privacy (PP).

On the other side, since consumers are exposed to several different risks and may experience them, consumer trust (CT) plays a significant role for dealing with uncertainty. Kim et al. (2009) stated that the more a consumer trusts in the service provider, the more willing they will be to intend to perform a behavior, including in the online banking environment, where trust plays an important role to make transactions with confidence and no vulnerability concerns. Then:

H21: Consumer trust (CT) will positively influence consumers' intention to adopt (IA).

H22: Consumer trust (CT) will negatively influence on consumers' perceived risk (R).

H23: Perceived privacy (PP) will positively influence consumer trust (CT).

H24: The description of the technology (DT) will negatively influence consumer trust (CT).

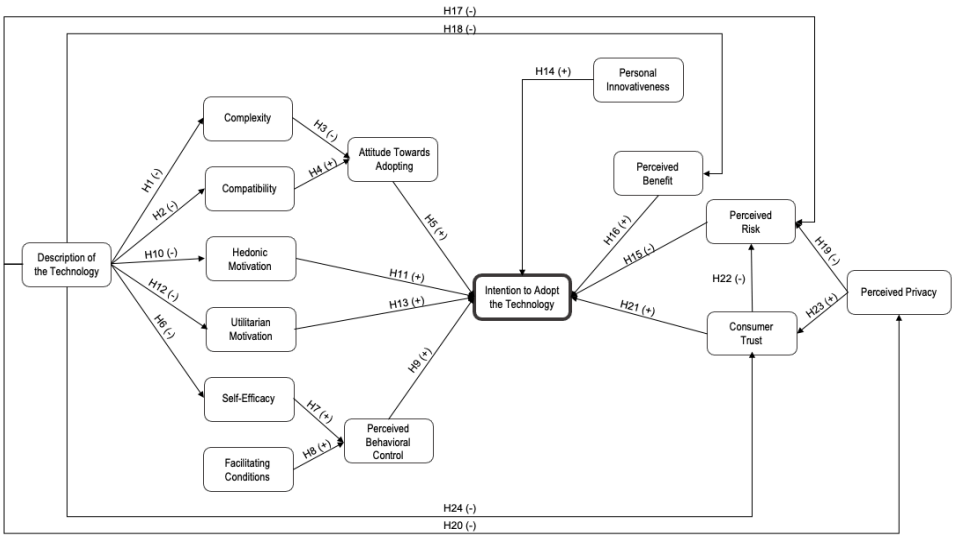

Figure 2 - Research model

The proposed research model is illustrated in the figure above. Besides the constructs used to measure the intention to adopt the technology, the model will also have four moderators: age, gender, education level, and financial planning. Socio-demographic characteristics have a determinant role in answering the research questions (Luo et al., 2010), helping to understand how age, gender, education level, and financial planning can influence the intention to adopt AI technologies.

Regarding age and gender, several studies have examined the influence of these moderators: Mattila (2008) explored the factors that influence Finish consumers to the mobile banking adoption by sample profiling and found that gender had a minor impact on the decision to adopt or not mobile banking but, on the other side, when analyzing the age, it showed that younger respondents were more receptive to it. The same was found by Alafeef et al. (2011), who understood that younger adults (under 25) are the segment that is more interested in using new banking technologies, becoming the next generation of technological potential banking consumers. Venkatesh & Morris (2000) explored the gender influence when adopting technology: even though in some studies it might not be the most significant moderator, it still affects the predisposition to adopt and use certain technologies, where perceived usefulness was more salient to men and, for example, when it comes to normative influences, women have a higher consideration about it. Generally, men have a higher potential to become mobile banking users than women. Regarding the education level, Mattila (2008) and Arif et al. (2020) found that an educated community will have a higher willingness to adopt technologies, which is also applicable to internet banking technologies, having a significant effect on the adoption of internet banking.

Lastly, we have financial planning as a moderator, a topic of discussion regarding consumer financial habits. Guzman et al. (2019) investigated the relationship between short and long-term financial planning, highlighting that analytical decision-making influences of financial planning. García Mata (2021) researched almost five thousand young Mexican adults between 18 to 35 years old, where 51% regularly used an ATM (Automated Teller Machine), and 36% had high financial knowledge. Safari et al. (2021) investigated the effect of financial literacy and personal retirement planning, finding that

the level of financial education is low, despite the majority of the respondents. The level of financial products knowledge is low, which influences the lack of information when financial decisions or plans are necessary.

4. METHOD

Given the need to understand the intention to adopt the innovation, a survey was developed in Qualtrics. All measurement items were adapted from the literature, as included in appendix B. The questionnaire was developed in English, based on the literature, and did not suffer any translation process.

The instrument is composed of several sections. The first question was to indicate how often the respondent uses an internet banking application in a week. The options were never, 1 or 2 times, 3 or 4 times, 5 or 6 times, more than 6 times, having a condition that if "never" was selected, then the respondent should jump to the end of the survey. This question was applied to ensure that were only considered answers from respondents familiarized with internet banking applications and its use.

As previously mentioned, the experiment will start from the use of two videos that will describe the technology. Both versions will differ in their contents, creating a basic and an exaggerated version. After watching the video, a true or false question was applied as a validation check to ensure that every respondent watched the video and was aware of the topic aborded in the video. When these questions were answered, a new section started with the constructs used in the model, on a seven-point Linkert scale, from strongly disagree (1) to strongly agree (7).

Perceived risk was the first construct that allows us to understand if respondents perceive a higher level of risk using this technology compared to traditional ways. Adapted from Gerlach & Lutz (2021), Kim et al. (2008, 2009), and Ryu (2018), it included items like "Using these technologies will be associated with a high level of risk, compared to traditional ways of financial management" or "By using this technology, I will be exposed to many risks".

Perceived privacy was used to measure private data concerns, such as "This technology will use my personal information for other purposes without my authorization" or "I am concerned about the privacy of my personal information during a transaction" (Kim et al., 2008).

Perceived benefit construct were adapted from Gerlach & Lutz (2021), Kim et al. (2008, 2009), and Ryu (2018) and were included in the questionnaire to depict positive emotions, as "convenient" or "time-saving".

Consumer trust is a construct from Kim et al. (2009) that depicts trust beliefs and behaviors with three different items. "Artificial intelligence technology in digital banking is trustworthy", "This technology gives the impression that it will keep promises and commitments", and "I believe that this technology and my Bank will have my best interests in mind".

Complexity construct evaluates if consumers perceive that using a banking technology that works with AI would be an elaborate innovation. Adapted from Davis (1989), Goodhue & Thompson (1995), and Taylor & Todd (1995), it has items like "Using artificial intelligence in digital banking applications will be easy to learn" or "The technology will be easy to operate".

Compatibility was also considered to understand if consumers believe the technology would be compatible with their lifestyles, including their finance management habits and banking interactions. The four constructs used are: "The technology will be compatible with my lifestyle" or "Adopting this technology will fit well with the way I like to manage my finances" (Lin, 2011; Taylor & Todd, 1995).

Self-efficacy (Taylor & Todd, 1995) was used to understand if consumers believe they would operate the technology with no concerns.

Facilitating conditions also by Taylor & Todd (1995) was used to understand if consumers believe they have the conditions to successfully operate this technology, having four different items related to this construct, such as "I believe it will be important to have the time and resources needed to use this technology" or "I believe I will have the time and resources to use the technology".

Hedonic motivation (Allard et al., 2009; Kim & Han, 2011; Venkatesh et al., 2012) was a construct applied to understand which subjective motivation could influence the consumers' intention to adopt AI technologies in internet banking, analyzing items like "fun", "enjoyable", "feel good" or "make me want to use it". Utilitarian motivation is also by Allard et al. (2009) and Kim & Han (2011) to understand the objective motivations inside the intention to adopt the behavior. Four items were applied.

Personal innovativeness. This construct evaluates if an individual considers having the propensity to adopt innovations easily (Oliveira et al., 2016; Yi et al., 2006).

Attitude towards adopting is one of the Taylor & Todd (1995) constructs that analyzes the behavior that will lead to a particular outcome – adopting or not adopting the technology. Two items were applied and asked to be rated on a 7-point scale. The items are "I like the idea of using a tool in my internet banking account that uses artificial intelligence" and "Using this technology is a good idea".

Perceived behavioral control (Taylor & Todd, 1995; Yi et al., 2006) is the perception that a consumer has the resources to perform a behavior and it includes three items: the first analyzes if one believes to be able to use the technology to manage their finances; the second analyzes if an individual believes to have the resources, knowledge, and ability to operate; the third item analyzes if one considers that the idea of using this technology is wise.

Lastly, *intention to adopt* from Taylor & Todd (1995) analyzes three different constructs: the first analyzes if the respondent intends to use a technology similar to the one under analysis; the second, if the respondent would try to use a technology similar to this one if available in their internet banking platforms; the third if the respondent would use the technology to manage their finances.

Besides the questions presented in appendix B and mentioned before, the questionnaire included financial planning and demographic questions that can be found in appendix C. The first question regarding financial planning was asking if the respondent was responsible for their money management. Regardless of the given answer, the second question was to understand if the respondent ever performed any financial investment. The demographic questions were a list with the countries to select the country of residence, a numerical input box for the age, and a selection for gender and education level.

Before launching the questionnaire, two pilot tests were conducted to assess its comprehension. The first pilot test was shared on Prolific and had poor results. A series of changes and modifications for a better understanding were applied and, after these changes, a second pilot test was shared. In the final survey, 328 responses were recorded from the contacted individuals through an online survey performed between April 13th and June 8th.

4.1. STUDY 1

4.1.1. Data

After eliminating 169 incomplete responses, as well as the 13 cases where respondents failed the manipulation check or the attention check, the definitive sample comprised 132 responses. 52.3% of the respondents saw the first video version, while 47.7%, which corresponds to 63 respondents, saw the exaggerated version. We can apprehend that the majority (33.3%) use internet banking three or four times a week, 40 respondents (30.3%) use it more than six times, and 21.2% use it one or two times. Regarding the final questions about money management and financial investments, it was possible to apprehend that 10 participants (7.6%) are not responsible for their money management. The majority (92.4%) are in charge of their money management. Lastly, concerning financial investments, 52.3% (69 responses) never performed financial investments, while 63 participants affirmed that they performed financial investments.

Distribution	**Mean**	**Std. Deviation**
Age	28.03	12.474

Table 2 – Study 1 age data of responses

Distribution		**Frequency**	**Percentage**
Gender	Female	73	55.3%
	Male	58	43.9%
	Non-binary	1	0.8%
Education Level	Secondary Education	43	32.6%
	Bachelor's Degree	58	43.9%
	Master's Degree	31	23.5%

Table 3 – Study 1 demographic data of responses

Analyzing the demographics in the table above, 73 respondents were female, and one was non-binary/third gender. Age ranged from 18 to 79 years old, and the mean age was 28 years old. Most of the participants reside in Portugal (91.7%). Other countries of residence include European countries such as the United Kingdom of Great Britain and Northern Ireland, Poland, Germany, and France. Around 67% of the sample has a degree, having the following educational level distribution: 32.6% with a high school degree, 43.9% with a bachelor's degree, and 23.5% with a master's degree.

4.1.2. Results

Once the data was cleaned, we proceeded to factor loadings and reliability analysis to guarantee that all the factors are statically significant and preferably greater than 0.7. Means, standard deviations, loadings, and t-statistic values from the measurements can be found in table 4.

Construct	Item	Mean	SD	Loading	Cronbach Alpha
Perceived risk (R)	R1	3.36	1.630	0.894	0.781
	R2	3.42	1.414	0.904	
Perceived privacy (PP)	PP2	3.39	1.679	0.845	0.916
	PP3	3.23	1.648	0.862	
Perceived benefit (PB)	PB1	5.83	1.195	0.820	0.875
	PB2	6.07	1.186	0.851	
	PB3	5.66	1.247	0.883	
	PB4	5.43	1.167	0.857	
Consumer trust (CT)	CT1	4.81	1.267	0.845	0.767
	CT2	4.81	1.167	0.801	
	CT3	4.50	1.565	0.843	
Complexity (C)	C1	5.16	1.369	0.820	0.900
	C2	5.33	1.227	0.891	
	C3	5.45	1.121	0.932	
	C4	5.49	1.201	0.883	
Compatibility (CM)	CM1	5.67	1.156	0.879	0.909
	CM2	5.46	1.367	0.926	
	CM3	5.52	1.245	0.956	
Hedonic motivation (HM)	HM1	5.11	1.189	0.842	0.879
	HM2	5.39	1.083	0.882	

	HM3	4.95	1.259	0.881	
	HM4	5.42	1.266	0.830	
Utilitarian motivation (UM)	UM1	4.93	1.167	0.784	0.892
	UM2	5.39	1.184	0.923	
	UM3	5.37	1.226	0.877	
	UM4	5.49	1.109	0.895	
Self-efficacy (SE)	SE1	5.65	1.098	0.790	0.850
	SE2	5.20	1.378	0.865	
	SE3	5.46	1.263	0.912	
	SE4	5.54	1.443	0.753	
Facilitating conditions (FC)	FC1	5.88	1.063	0.812	0.822
	FC2	5.86	0.958	0.863	
	FC3	5.75	1.115	0.833	
	FC4	5.57	1.093	0.731	
Personal innovativeness (PI)	PI1	4.88	1.446	0.842	0.806
	PI2	4.08	1.602	0.865	
	PI3	5.34	1.341	0.844	
Attitude towards adopting (ATA)	ATA1	5.16	1.190	0.918	0.812
	ATA2	5.46	1.087	0.918	
Perceived behavior control (PBC)	PBC1	5.49	1.045	0.882	0.840
	PBC2	5.34	1.250	0.828	
	PBC3	5.42	1.120	0.911	
Intention to adopt (IA)	IA1	5.52	1.169	0.886	0.906
	IA2	5.24	1.297	0.929	
	IA3	5.45	1.155	0.940	

Table 4 – Study 1 mean, standard deviation, and loadings

R3, *PP1* (loading on the threshold), *PP4*, and *PP5* items were excluded due to the low loading. The other items were included (loadings above 0.7), presenting good reliability indicators. To evaluate the reliability of the constructs, we performed Cronbach's alpha analysis to guarantee internal consistency. We proceeded to the hypothesis using analysis of variances (ANOVA), linear regressions, and moderation effects, using the PROCESS SPSS macro model 1, 2, and 3 by Hayes (2022).

Hypothesis 1 showed that complexity is not significant under the technology description influence (M=5.36, SE=0.095, $F_{(1, 130)}$=0.04, *p*=0.848), where both groups somewhat agree that the use of this technology will be understandable. The financial planning moderator has a marginally significant effect on this hypothesis (β=-1.44, *p*=0.04) for those who are not responsible for their money management, neither performed financial investments. On H3 we stated that complexity negatively influences consumers' attitudes towards adopting. By running a linear regression, we concluded that although statistically significant, the hypothesis is not confirmed (β=0.488, *p*<0.001). Due to the obtained positive effect, the higher the complexity, the more positive one's attitude will be towards the technology.

Running a One-way ANOVA, H2 is not statistically significant (M=5.56, SE=0.101, $F_{(1, 130)}$=1.28, *p*=0.261). Individual analyzes of the factors highlighted that both groups manifested that using this technology could be compatible with their financial management needs, as observed in *CM1* (M=5.68, SE=0.101, $F_{(1, 130)}$=1.29, *p*=0.258) and *CM3* (M=5.53, SE=0.11, $F_{(1, 130)}$=2.428, *p*=0.122). There is also a marginally significant effect for individuals who do not have financial planning habits (β=-1.79, SE=0.73, *p*=0.02) and those who do not manage their money but performed financial investments (β=-1.67, SE=0.80, *p*=0.04). H4 outcomes proved that this hypothesis is statistically significant (β=0.478, *p*<0.001), being the best construct to explain the attitude towards adopting variance (R^2=0.279). This effect is statistically significant for people who manage their money, whether they are male (β=0.50, *p*<0.001) or female (β=0.54, *p*<0.001).

On H5, we stated that attitude towards adopting positively influences intention to adopt. This hypothesis is also confirmed (β=0.754, p<0.001), being the best construct to explain the intention to adopt variance (R^2=0.506). Also, when the attitude towards adopting increases one standardized unit, the intention to adopt increases by 0.75 standardized units, *ceteris paribus*.

The results obtained for H10 proved that the hypothesis is not statistically significant (M=5.22, SE=0.090, $F_{(1, 130)}$=0.003, *p*=0.954). Both groups, regardless the DT version, agree that using this technology will bring a sense of feeling good and pleasure. On *HM3* "(…) make me feel good" (M=4.95, SE=0.110, $F_{(1, 130)}$=0.50, *p*=0.479), the group under manipulation proved to be slightly affected by the video on their hedonic motivation perception (M_{AI}=5.87, SE_{AI}=0.159, and M_N=5.03, SE_N=0.152)[2]. H11 stated that hedonic motivation positively influences the intention to adopt. This hypothesis is statistically significant and thus confirmed (β=0.688, *p*<0.001), explaining 40.8% of intention to adopt variance. There are also significant effects for those who manage their financial assets, whether they are young (β=0.72, *p*<0.001) or old (β=0.72, *p*<0.001).

[2] AI stands for the exaggerated version of the video with topics related with artificial intelligence, while N stands for the basic video version

Utilitarian motivation includes four different factors. The effect of the technology description on this variable (H12) is not statistically significant (M=5.30, SE=0.089, $F_{(1, 130)}$=0.41, *p*=0.525). The factor *UM1* "… I will accomplish exactly what I want to manage my finances" is marginally significant (M=4.92, SE=0.100, $F_{(1, 130)}$=4.29, *p*=0.04) and, as expected, the description influences the utilitarian motivation perception (M_{AI}=4.71, SE_{AI}=0.145, and M_N=5.13, SE_N=0.139), demonstrating that the description tends to bias the technology usage and practical motivation perception. H13 is also statistically significant (β=0.719, *p*<0.001) and explains 43.7% of the intention to adopt variance. Comparing the motivation constructs in the model, we can conclude that utilitarian motivation has a higher explanatory capacity, meaning that the respondents tend to give more importance to practical usability than how this technology makes them feel.

H6 is not statistically significant (M=5.46, SE=0.094, $F_{(1, 130)}$=0.56, *p*=0.457). Individual ANOVA analysis on self-efficacy indicated that both groups seemed to know-how and will be comfortable by using this technology. In H7, we stated that self-efficacy positively affects perceived behavioral control, and this hypothesis is confirmed (β=0.636, *p*<0.001), being the most important construct in explaining perceived behavioral control. H8 is the hypothesis that predicts that facilitating conditions will have a positive effect on consumers' perceived behavioral control. This hypothesis is thus confirmed, proving that individuals believe they have the resources to use this technology (β=0.719, *p*<0.001). Running a model 1 PROCESS Macro moderation analysis, we found that there is a significant effect for those responsible for their money management (β=0.73, *p*<0.001). This might happen because they are used to the practice.

The observed H5 is also observed in the H9, confirming the hypothesis stated – when perceived behavioral control increases by one standardized unit, intention to adopt increases by 0.79 standardized units, *ceteris paribus* (β=0.793, *p*<0.001), explaining 50% of intention to adopt variance. The effect of money management habits in this hypothesis is marginally significant (β=0.46, *p*=0.04).

H14 is statistically significant in explaining the intention to adopt the technology (β=0.521, *p*<0.001), proving that when the natural propensity to innovation and technologies increases by one standardized unit, the intention to adopt increases 0.52 standardized units, *ceteris paribus*. Also, personal innovation explains 34.2% of intention to adopt variance. Running a moderation analysis, we can assume that, although money management habits do not have a significant effect on this hypothesis (β=0.09, *p*=0.74), there is a significant effect for the individuals who are responsible for their money management (β=0.53, p<0.001).

Regarding the influence of the description of the technology on perceived risk, H17 is not confirmed, and the mean values show that the risk perception is low (M=3.39, SE=0.121, $F_{(1, 130)}$=0.42, *p*=0.518), where the group under the exaggerated effect has a higher risk perception as initially stated (M_{AI}=3.47, SE_{AI}=0.175, and M_N=3.31, SE_N=0.167). H15 is confirmed (β=-0.251, *p*<0.001), proving that the risk influences the intention to adopt, explaining 9.8% of the variance. Gender has a positive effect on the risk influence on the intention to adopt the technology (β=-0.33, *p*=0.01), being significant for women (β=-0.44, *p*<0.001). The same occurs in age (β=0.01, *p*<0.01), having a significant effect on younger (β=-0.39, p<0.001) and middle-aged individuals (β=-0.27, *p*<0.001).

The effect of the video on perceived privacy was not confirmed (M=3.31, SE=0.14, $F_{(1, 130)}$=0.02, *p*=0.877). Analyzing the factors individually, we understand that perceived privacy differs in both

groups. As we can analyze from *PP1* "The Bank where I will use this technology may collect too much information from me" (M=4.48, SE=0.131, $F_{(1, 130)}$=0.95, *p*=0.331), the results showed that the group under the exaggerated effect agrees with the belief that using this technology, their transactional, personal or any other data type might be collected (M_{AI} = 4.60, SE_{AI} = 0.189 and M_N = 4.35, SE_N = 0.181). H19 is significant (β=0.217, *p*=0.004). Perceived privacy has a positive effect on risk perception, meaning that the confidence the individuals have in the financial institution that guarantees their data protection does not guarantee that their risk perception will be lower. H23 (β=-0.264, *p*<0.001) is also significant, but the effect is negative, meaning that it is expected that their perceived privacy will negatively influence their trust.

The video effect on the perceived benefit is not significant and we can conclude that the respondents somewhat agree with the existence of benefits regarding technology usage (M=5.745, SE=0.089, $F_{(1, 130)}$=0.07, *p*=0.789), following the results obtained in the risk perception - the lower the risk, the higher the benefits one can take from using the technology. Running a linear regression, H16 is also confirmed (β=0.604, *p*<0.001) and explains 31% of the intention to adopt variance, having a positive effect on individuals who manage their financial assets and the benefits of using the technology (β=0.62, *p*<0.001).

Consumer trust is not significant (M=4.071, SE=0.097, $F_{(1, 130)}$=0.01, *p*=0.932) and tends to have a negative effect on the manipulation group. For example, the first factor that explores the trustworthiness of AI technologies (M=4.81, SE=0.111, $F_{(1, 130)}$=0.08, *p*=0.777) shows that the second group tends to be more in disagreement compared with the opposite group (M_{AI}=4.78, SE_{AI}=0.160, and M_N=4.84, SE_N=0.153), although their trust perception is somewhat positive. H21 is confirmed (β=0.529, *p*<0.001), and H22 are also confirmed (β=-0.261, *p*<0.001), meaning that the stronger the trust in the technology, the risk effects will be lower.

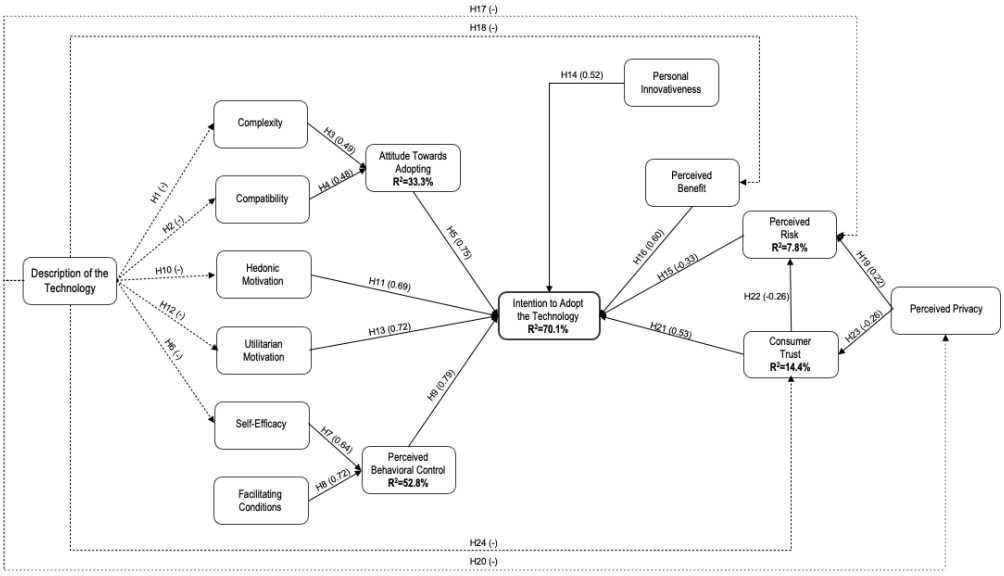

Figure 3 - Structural model results for study 1

Finally, analyzing the intention to adopt construct, we conclude that the overall regression model is significant ($F_{(8, 130)}$=35.83, *p*<0.001). The predictors' attitude towards adopting, hedonic and utilitarian motivation, perceived behavioral control, personal innovativeness, perceived benefit, risk,

and consumer trust explain 70.1% of the intention to adopt. In the figure, hypothesis that are not significant are represented in dashed arrows.

4.2. STUDY 2

4.2.1. Data

As previously explained, the survey included two checks. Due to the size of the research, one of those was an attention check, asking for the participants to click on number 5 in the utilitarian motivation questions. As it might has been perceived as an error or raised doubts during the survey, it has been decided to run a second analysis where the participants who failed in this check are included in the final research. Hence, the final sample for study 2 has 155 final responses. From the same initial 159 responses that do not include the incomplete responses, we only removed four respondents that failed the validation check. The final sample has more 23 responses than the considered in the first study. Although this is not a considerate increase, we will follow the analysis to understand if there is any significant change.

Regarding the demographics, of the 155 final responses, 52.3% saw the basic video. 32.9% of the respondents use internet banking three or four times, while 30.3% use it frequently. Regarding the financial planning questions, 145 people are responsible for their money management, corresponding to 93.5%. Regarding financial investments, 51.6% affirmed that never did any type of financial investments. Demographics are summarized in the table below. Compared to the first results obtained in the principal analysis, there is still considerable a group of younger respondents and females.

Distribution	Mean	Std. Deviation
Age	29.07	13.863

Table 5 – Study 2 age data of responses

Distribution		Frequency	Percentage
Gender	Female	84	54.2%
	Male	68	43.9%
	Non-binary	2	1.3%
	Prefer not to say	1	0.6%
Education Level	Secondary Education	47	30.3%
	Bachelor's Degree	64	41.3%
	Master's Degree	43	27.7%
	Doctor's Degree	1	0.6%

Table 6 – Study 2 demographic data of responses

Analyzing the demographics in the table above, 84 respondents were female, and 2 were non-binary/third gender, having 1 individual who preferred to not refer the gender. Age ranged from 18 to 79 years old, and the mean age was 29 years old. Most of the participants reside in Portugal (89.7%) although the percentage of Portuguese participants decreased comparing to the demographic results of study 1. Other countries of residence include European countries such as the United Kingdom of Great Britain and Northern Ireland or Germany. Lastly, around 70% of the sample has a degree, having the following educational level distribution: 30.3% with a high school degree, 41.9% with a bachelor's degree, 27.1% with a master's degree, and 1 person with a doctor's degree.

4.2.2. Results

The same process applied in study 1 was applied in this sample: the data was cleaned; factor loadings and reliability analysis were processed to guarantee that all the factors are statically significant and preferably greater than 0.7. Means, standard deviations, loadings, and t-statistic values from the measurements can be found below.

Construct	Item	Mean	SD	Loading	Cronbach Alpha
Perceived risk (R)	R1	3.32	1.666	0.894	0.818
	R2	3.34	1.491	0.910	
Perceived privacy (PP)	PP1	4.44	1.529	0.708	0.813
	PP2	3.43	1.694	0.852	
	PP3	3.26	1.664	0.865	
Perceived benefit (PB)	PB1	5.81	1.244	0.841	0.878
	PB2	6.01	1.261	0.857	
	PB3	5.61	1.350	0.877	
	PB4	5.35	1.283	0.848	
Consumer trust (CT)	CT1	4.81	1.320	0.867	0.806
	CT2	4.82	1.203	0.835	
	CT3	4.54	1.609	0.858	
Complexity (C)	C1	5.20	1.374	0.823	0.907
	C2	5.37	1.254	0.896	
	C3	5.46	1.208	0.937	

	C4	5.50	1.276	0.892	
Compatibility (CM)	CM1	5.66	1.192	0.894	0.910
	CM2	5.47	1.388	0.930	
	CM3	5.51	1.286	0.940	
Hedonic motivation (HM)	HM1	5.12	1.259	0.864	0.903
	HM2	5.35	1.199	0.905	
	HM3	4.94	1.335	0.901	
	HM4	5.35	1.389	0.856	
Utilitarian motivation (UM)	UM1	4.90	1.283	0.828	0.909
	UM2	5.36	1.232	0.932	
	UM3	5.30	1.311	0.889	
	UM4	5.48	1.208	0.899	
Self-efficacy (SE)	SE1	5.56	1.238	0.821	0.854
	SE2	5.14	1.475	0.883	
	SE3	5.41	1.342	0.900	
	SE4	5.54	1.443	0.738	
Facilitating conditions (FC)	FC1	5.85	1.146	0.832	0.858
	FC2	5.86	1.068	0.867	
	FC3	5.65	1.242	0.867	
	FC4	5.50	1.186	0.787	
Personal innovativeness (PI)	PI1	4.84	1.544	0.789	0.801
	PI2	4.14	1.706	0.851	
	PI4	5.32	1.423	0.855	
Attitude towards adopting (ATA)	ATA1	5.20	1.326	0.926	0.831
	ATA2	5.44	1.217	0.926	
	PBC1	5.49	1.19	0.901	0.864

Perceived behavior control (PBC)	PBC2	5.35	1.316	0.848	
	PBC3	5.40	1.231	0.919	
Intention to adopt (IA)	IA1	5.47	1.291	0.917	0.932
	IA2	5.21	1.404	0.945	
	IA3	5.37	1.285	0.955	

Table 7 - Mean, standard deviations, and loadings for study 2

R3, *PP4*, *PP5*, and *PI3* items were excluded due to the low loading. The other items were included (loadings above 0.7), presenting good reliability indicators. To evaluate the reliability of the constructs, we performed Cronbach's alpha analysis to guarantee internal consistency. We proceeded to the hypothesis using analysis of variances (ANOVA), linear regressions, and moderation effects, using the PROCESS SPSS macro model 1, 2, and 3 by Hayes (2022). The results were very similar to the obtained in the previous study and can be analyzed in the previous table.

H1 showed that complexity is not significant under the technology description influence (M=5.38, SE=0.091, $F_{(1, 154)}$=0.115, *p*=0.734). On H3, we stated that complexity negatively influences consumers' attitudes towards adopting. This hypothesis was confirmed in study 1 and is also confirmed in study 2 (β=0.569, *p*<0.001), having a R^2=29.9%, which means that around 30% of the variability observed in the attitude towards adopting is explained by the complexity. The moderators' analysis proved to have no major impacts.

H2 is also not statistically significant (M=5.548, SE=0.096, $F_{(1, 154)}$=0.233, *p*=0.630). On study 1, we found that there is a marginally significant effect for individuals who do not have financial planning and also for individuals who do not manage their money but already performed financial investments. On study 2, we only find a marginally significant effect for individuals who do not manage their money (β=-1.67, SE=0.75, *p*=0.03). H4 outcomes proved that in this sample, the hypothesis is also significant (β=0.587, *p*<0.001), having a higher R^2=35.2% comparing to study 1, which means that in this study compatibility has a greater explanatory power and therefore we can assume that this technology should be compatible with the users' lifestyle.

Regarding our H5, it is also confirmed (β=0.829, p<0.001). On this study, this construct also increases the explanatory power from R^2=50.6 in study 1 to R^2=61.4, which means that it is still the best construct to explain attitude towards adopting. Also, when the attitude towards adopting increases one standardized unit, the intention to adopt increases by 0.83 standardized units, *ceteris paribus*.

For H10, we ran an univariate analysis and it was possible to find that the hypothesis is not statistically significant (M=5.19, SE=0.092, $F_{(1, 154)}$=0.254, *p*=0.615). No major impacts were found regarding the moderators. H11 stated that hedonic motivation positively influences the intention to adopt. This hypothesis is statistically significant and thus confirmed (β=0.79, *p*<0.001), explaining 52.3% of the intention to adopt variance, which represents an increase of 11.5 percentual points, comparing to the study 1.

Regarding utilitarian motivation, the effect of the technology description on this variable (H12) is not statistically significant (M=5.26, SE=0.090, $F_{(1,\ 154)}$=0.706, *p*=0.402). H13 is also statistically significant (β=0.812, *p*<0.001) and explains 52.8% of the intention to adopt variance. Comparing the motivation, we can conclude that utilitarian motivation has a slightly higher explanatory capacity but not significant enough to conclude that hedonic motivation has a strong impact on consumers, concerning the research motivation.

H6 was also not statistically significant (M=5.41 , SE=0.092, $F_{(1,\ 154)}$=2.096, *p*=0.150). On H7 we stated that self-efficacy positively affects perceived behavioral control. This hypothesis is confirmed (β=0.684, *p*<0.001), explaining 52.9% of perceived behavioral control variance. On H8, we stated that facilitating conditions will have a positive effect on consumers' perceived behavioral control. The results proved that the hypothesis is statistically significant (β=0.761, *p*<0.001), as it explains around 47% of the perceived behavioral control variance. In the study 1, self-efficacy was the best construct to explain perceived behavioral control and the same occurs in study 2, according to the results.

The H9 is confirmed – when perceived behavioral control increases by one standardized unit, intention to adopt increases by 0.87 standardized units, *ceteris paribus* (β=0.871, *p*<0.001), explaining 57.2% of intention to adopt variance. Perceived behavior control is still the second-best construct to explain the intention to adopt.

Regarding the construct personal innovativeness, we have H14. The results proved that the hypothesis is statistically significant (β=0.576, *p*<0.001). This means that when the natural propensity to innovation increases one standardized unit, the intention to adopt the technology increases around 0.58 standardizes units, ceteris paribus. In study 1, the R^2=34.2%. In this study, R^2=0.373, explaining 37.3% of intention to adopt variance.

Regarding the privacy calculus, there are a few hypotheses that tries to explain different behaviors and perceptions regarding risk, privacy, benefit, and trust. The first hypothesis we analyze is H17 and we conclude that the hypothesis is also not confirmed (M=3.33, SE=0.117, $F_{(1,\ 154)}$=1.74, *p*=0.190), where the group under the exaggerated effect has a higher risk perception as initially stated (M_{AI}=3.47, SE_{AI}=0.169, and M_N=3.18, SE_N=0.161). On H15 we stated that risk influences the intention to adopt the technology and the hypothesis is confirmed (β=-0.288, *p*<0.001), explaining 11.3% of the variance, which is an increase, regarding the study 1.

The effect of the video on perceived privacy was not confirmed (M=3.71, SE=0.112, $F_{(1,\ 154)}$=0.451, *p*=0.503). H19 (β=0.411, *p*<0.001) is significant and it is confirmed that perceived privacy has a positive effect on risk perception. Regarding H23 is also significant (β=-0.348, *p*<0.001), but the effect is negative. As it is stated in study 1, where the same occurred, it is expected that perceived privacy will negatively influence the user's trust.

The video effect on the perceived benefit is not significant, and we can conclude that the respondents somewhat agree with the existence of benefits regarding technology usage (M=5.69, SE=0.088, $F_{(1,\ 154)}$=1.030, *p*=0.312). Running a linear regression, H16 is also confirmed (β=0.722, *p*<0.001) and explains 40.6% of the intention to adopt variance, having a positive effect on individuals who manage their financial assets (β=0.74, *p*<0.001).

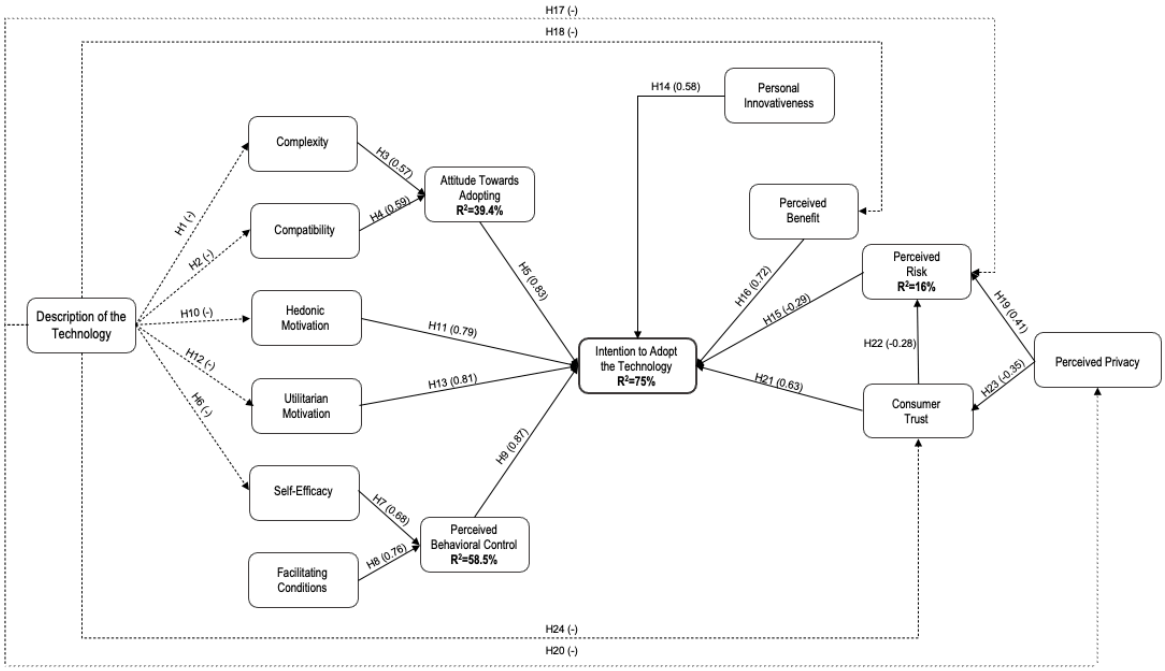

Figure 4 - Structural model results for study 2

Consumer trust is not significant (M=4.719, SE=0.095, $F_{(1, 154)}$=0.05, *p*=0.823). H21 is confirmed (β=0.629, *p*<0.001), as it explains 35.3% of the intention to adopt variance, and H22 are also confirmed (β=-0.283, *p*<0.001), meaning that the stronger the trust in the technology, the risk effects will be lower.

Finally, analysing the intention to adopt construct, we conclude that the overall regression model is significant ($F_{(8, 122)}$=54.466, *p*<0.001). The predictors' attitude towards adopting, hedonic and utilitarian motivation, perceived behavioral control, personal innovativeness, perceived benefit, risk, and consumer trust explain 75% of the intention to adopt.

5. CONCLUSION

The research intends to understand what drives consumers to adopt AI banking technologies. It is unique for the topic under discussion and the combination of DTPB, personal innovativeness, and privacy calculus, provides evidence about what might influence internet banking users to adopt disruptive technologies to manage their financial assets.

Across a unique study and an experiment that divided this study into two parts, we provide evidence that, besides attitude towards adopting and perceived behavioral control, hedonic and utilitarian motivation are the best constructs to explain the intention to adopt. Risk does not have a strong explanatory power regarding the dependent variable. These results corroborate existing research. As an example, the results suggest that to adopt a digital banking technology, individuals look for the motivation behind, if the tool is compatible with their lifestyle and if they believe to have the capacity to use it. Innovative individuals have higher propensity to adopt the technology. Next, we discuss the implications of these findings as theoretical and practical contributions.

Banking technologies that use AI are a new concept in many countries. Individuals are unaware of the usage, advantages, and performance. As a result, the hypothesis regarding the technology description is not significant. Although the introductory video did not affect respondents as expected, there were slight differences in the results obtained from both groups, where some corroborated the idea that individuals under the exaggerated video would have their perception affected by the technology description, as it happened in the construct UM1, as an example.

Considering the effects obtained in the hypothesis that evaluates the complexity and compatibility, although we expected that complexity negatively influences one's attitude towards adopting, the effect is positive. It means that if one perceives the technology as difficult, the more positive the attitude towards it. It might be related to the idea that the simpler the technology, the lower the value, the processing capacity, or even the features might not accomplish the needed tasks in the consumers' eyes (Taylor & Todd, 1995). Nonetheless, the idea of using this technology was well received by the respondents, having 50.6% of the intention to adopt explained by attitude toward adopting (Ho et al., 2020; Kazemi et al., 2013; Rogers et al., 1971). Therefore, when launching tools that use AI to aggregate information and work on insights, banks and financial enterprises should consider that customers and new users should be capable to use it, not having unexpected conditions that negatively shape the user experience, although healthy complexity is suggested.

The decomposition of motivation into hedonic and utilitarian shows that each are positively related to the intention behavior. Besides attitude towards adopting and perceived behavior control, these two constructs have a higher explanatory power regarding the intention to adopt the technology. Our empirical results suggest that the probability of adopting the technology is higher for consumers who consider the technology enjoyable and beneficial to managing finances (Alalwan & Williams, 2014; Sharif & Raza, 2017), being two important drivers to understand technology use and adoption (Venkatesh et al., 2012). Hence, banks should consider strategies and campaigns to attract innovators and distinct user interfaces and experiences to retain users (Luo et al., 2010; McKnight et al., 2002). Even though both motivation constructs are significand to our dependent variable, on study 2 hedonic motivation had slightly more importance. This construct explains the enjoyment and pleasure-seeking motivation to use this technology (Sharif & Raza, 2017) and the difference between

both studies might happen due to an increase of female and younger respondents (Venkatesh et al., 2012).

This research aimed to understand the behavior regarding a new technology and the need to evaluate one's propensity to technology was clear. We added personal innovation and it had great explanatory power - it explains 34.2% of the intention to adopt variance. Also, the combination of personal innovativeness slightly increases the intention to adopt explanation from 68.4% to 70.1%, ceteris paribus. Hence, if someone has a natural propensity to try innovations, then there is a natural stimulus to adopt the technology under research. When creating the technology, this attribute should consider this attribute to the customer leads. Well-informed customers and those used to try new technologies will also be a beneficial lead cluster. Hence, and as previously suggested, marketing strategy should give consumers the idea of an easy and beneficial tool that matches their lifestyle with innovative features, emphasizing the usefulness of faster money management, analysis, or payment performance (Patil et al., 2020).

Perceived behavioral control is affected by self-efficacy and facilitating conditions. Self-efficacy and facilitating conditions explain 52.8% of perceived behavioral control, whereas self-efficacy has a higher effect (R^2=47.9). In the context of launching and deploying a new solution, the results recommend that banks raise self-efficacy by influencing consumers about being capable to use and perform these technologies it will increase their behavioral usage intentions, especially for those who already have money management habits. At the same time and as supported by previous literature, banks should guarantee the necessary technical and customer care infrastructures to support the adoption (Safeena et al., 2013; Tan & Teo, 2000; Wang et al., 2021). The results confirm that besides attitude towards adopting, perceived behavioral control is one of the best constructs in explaining the model, explaining 50% of intention to adopt variance.

Regarding the privacy calculus, perceived benefit explains 31%, perceived risk explains 9.8%, and consumer trust explains 28.1% of the variance of intention to adopt. Also, consumer trust and perceived privacy explain 7.8% of risk variance. DTPB explains 62.6% of the intention to adopt variance. By coupling the privacy calculus constructs, the explanatory power increases to 66.9%. The results contribute to the research by demonstrating that the enablers have the highest explanatory capacity, meaning that at the perceived trust and benefit that the respondents could take from using the technology is higher and, therefore, it is more important to explain their intention to adopt.

Starting from perceived risk, we understand that the relationship between risk and intention is confirmed by a negative effect: the higher the risk perception, the lower the intention to adopt the technology (Lee, 2009; Martins et al., 2014). Also, we found no support for risk is significant for women and younger/middle-aged individuals.

The second inhibitor is perceived privacy, and we formulated two hypotheses regarding this construct. The first one indicated that the relationship between privacy and risk was positive, meaning that the confidence that personal information is secure affects the risk perception by decreasing it (Luo et al., 2010). Surprisingly, there is a positive path between perceived privacy and risk, implying that the higher the perception that the technology will guarantee security protection, the higher the risk is perceived towards the technology. One possible explanation for this relationship is that if users increase their awareness about the traits and that personal information might be used for other

purposes, then they are consequentially more aware of the risks they may face by using this technology. In other words, if consumers might get suspicious that their transaction data is being carefully protected for external danger, they will automatically increase their risk perception.

The second hypothesis indicated that the relationship between perceived privacy - trust is positive, corroborating Kim et al. (2008, 2009). Once again and against the prediction, there is a negative path between perceived privacy and trust, meaning that the higher the perception that their data is secure, the lower the trust they will have in the technology. An explanation that might justify the obtained result is the constructs phrasing: on perceived privacy variable, the factors used to measure the use of personal data without authorization, for other persons and the access of third parties to personal information, while consumer trust measures the trustworthiness, the commitment, and the idea that the bank and the technology will keep the best interests when it comes to their users. As we can see, both constructs analyze different perspectives - when perceived privacy looks into the negative side of data security, consumer trust has a positive approach. This result is not contradictory to the expected: taking into consideration the factors phrasing, when perceived privacy and the idea that personal data is not secure increases, the trust automatically decreases, and *vice versa*.

Now analyzing the enablers of the privacy calculus, we conclude that the benefits and intention to adopt effect is positive, following previous literature (Njenga & Ndlovu, 2012). Since it is the strongest privacy calculus predictor, banks should consider that individuals seek what is beneficial when using the technology by designing and offering a technology that addresses the perceived benefits and risks. As mentioned by Gerlach & Lutz (2021), the balance between risks and benefit is in line with the "trust" factor that is crucial in the financial products field (Ennew & Sekhon, 2007; Sunikka et al., 2010). The first hypothesis that relates trust to the intention to adopt is confirmed, meaning that if one perceives the technology as trustworthy, one will perceive fewer risks, and vice versa, as suggested by Jouda et al. (2020). The second hypothesis is also confirmed: as also stated by Luo et al. (2010), if an individual trusts the technology, then the risk perception will be lower.

6. LIMITATIONS AND FUTURE RESEARCH

To encourage the continuous pursuit of knowledge, it is important to acknowledge the limitations of this research and future improvements.

Regarding the sample, the respondents were mainly young and highly educated Portuguese individuals. The sample size was small due to the attention and validation checks. This sample profile tends to be more innovative and less aware of risks and data privacy, which might influence the results. Future research should take into consideration this concern and try to analyze a more diverse sample.

Regarding the model, the holistic approach it can give to different technologies can bring new insights. Therefore, this model can be applied to banking or other sector technologies. One suggestion is to include more moderators related to the topic under investigation. In the case of this research, besides financial planning, another moderators could be "invasion of privacy in the past" (Malhotra et al., 2004), for example.

Looking at the constructs used, there is space for beneficial changes. Firstly, and regarding complexity, the majority of the studies state that the higher the complexity, the lower the attitude towards adopting. As mentioned before, this behavior was not observed in this research and there are several explanations for the obtained results. One of them, suggested by Taylor & Todd (1995) is that complexity can have different levels and those levels might affect attitude differently. Trying to measure what type of complexity (technical, user experience, or features) and at what levels affect the attitude towards adopting the technology might bring new insights about the topic. This could be important to the technology development.

Aforementioned, several models could be applied to understand the behavioral intention to adopt AI banking technologies. One of the models is the extended UTAUT by Venkatesh et al. (2012). Although this model has similarities with the used research model, such as hedonic motivation, facilitating conditions, and effort expectancy, there are other constructs used in UTAUT that could be interesting to apply. One of the constructs is habit – the belief that certain behavior is automatic, regarding being familiar with the use of the technology. Since this is not a common technology in the market, it did not make sense to apply in the research. Future research should consider including habit and evaluate if individuals can create the habit of doing regular usage of financial management technologies.

The social influence we receive to use different products or services highly affects how the intention to adopt and use them. Several literature investigated how social and subjective norms influence our decisions (Puah et al., 2021; Venkatesh & Morris, 2000). To understand how context influences behavioral intention, future research should include constructs that evaluate social influence, such as subjective norms (George, 2004; Gerlach & Lutz, 2021; Taylor & Todd, 1995).

Personal innovativeness was one of the strongest variables to explain the intention to adopt behavior in our research. Regarding the explanatory power, more constructs could be incorporated in the research model to understand how innovation traits can influence the intention to adopt. The study conducted by Thakur et al. (2016) regarding technological leadership has an interesting approach: besides personal innovativeness, they used 3 other constructs - technological opinion

leadership which explains the opinion of leaders in the field of IT and new technologies with the ability to influence others' people decision behavior (Childers, 1986; Rogers & Cartano, 1962); technology innovativeness which is the construct that explains if consumers are motivated to be the first to buy and own high tech products (Bruner & Kumar, 2007) and is also important due to the accuracy when predicting innovative consumer behaviors; gadget lovers that explain the intrinsic interest and motivation to adopt cutting edge innovations (Bruner & Kumar, 2007). The combination of these constructs might offer a wider approach regarding innovation and can also help to explain the intention to adopt the behavior.

Risk is a construct that has been widely investigated and it is can highly affect innovation. In this research, we opted to understand the impact of perceived risk, but several theories decompose perceived risk to enrich the results. Hence and to overcome this limitation, future research can select one of these theories to understand what are the concerns that influence risk. One of the theories can be Featherman & Pavlou (2003), although there are different and interesting theories to analyze the risk concerns (Ryu, 2018).

We used perceived privacy to understand if individuals believe their data was protected from banks and, therefore, relate it to trust and risk. At the same time, there is a logical causal effect in those relationships: our privacy calculus ended with one inhibitor (risk) against three enablers (trust, benefit, and privacy). To equilibrate the privacy calculus, it is suggested to change the overview and use a construct similar to perceived privacy (Luo et al., 2010) to understand the same information but from a concerning point of view.

Regarding the constructs, the last note for future research is related to perceived benefit. As well as in risk, perceived benefit is a wide topic that can be decomposed to also enrich the results. There might be different theories that enrich the benefit explanatory power but there are also good constructs that could be combined with perceived benefits, such as gamification and rewards. Gamification can be described as the integration of game features to motivate users, making the financial applications or tools funnier and challenging, increasing the users' engagement level while learning (Deterding et al., 2011; Hamari, 2013; Rodrigues et al., 2016). Rewards are a strategy applied by banks and financial institutions that, when applied, will increase the users' appreciation, having an implicit bonus provided by the enterprise (Lepper & Greene, 2015). In the case of this technology could be cashback rewards for the users. Besides gamification and strategy, simpler decomposed benefits can also be the economic benefit, seamless transactions, and convenience, as postulated in the research model of Ryu (2018).

Lastly, this research model is a general approach to different subjects, such as risk and benefits, behavior, and motivation. The principal reason to follow this approach was to enlighten and inspire future research and bring knowledge about the topic. Once the topic becomes a frequent research topic and the technologies become popular, new investigations shall be made to understand what influences consumer adoption, recommendation, initial trust, and so forth. Future research can shed light on different variables or explore specific features of the technology for a better understanding of what leads consumers to adopt AI technologies, such as electronic word-of-mouth (Parry et al., 2012), perceived technology security (Yi et al., 2006), user experience (Distler et al., 2020), or even security protection and privacy legislation (Kim et al., 2008).

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APPENDIX A: SUMMARY OF PREVIOUS RESEARCH ON INTERNET BANKING

Theory	Findings	Authors
Unified Theory of Acceptance and Use of Technology	• Perceived risk increases the power of UTAUT to explain the intention to adopt internet banking: performance expectancy, effort expectancy, and social influence explain 56% of the variance but, by coupling the perceived risk, it increases by 4 p.p. of the explained variance. • Both models together explain 81% of usage behavior variance, having a stronger predictive behavior. • Facilitating conditions are not significant over usage behavior, proving that the respondents are not concerned about the necessary infrastructures or knowledge to use the technology, although they are concerned about other people's opinions. • Performance, financial, time, and privacy risks are the most considered concerns for perceived risk.	Martins et al. (2014)
Diffusion of Innovations	• Innovativeness is validated on compatibility, effort expectancy, and behavioral intention, which proves that this construct is important when validating the adoption of user-centric technologies. • The more innovative and well-informed the user, the more willing to use mobile payment technologies he/she will be.	Oliveira et al., 2016
Decomposed Theory of Planned Behaviour	• Compatibility, perceived usefulness, and perceived risk influence attitudes towards the intention to adopt mobile banking. • Perceives risk is critical to consider when creating a baking application or any other service to their customers. • To reduce perceived risk, the authors suggest sustainable development to guarantee stable and secure services and data security for the customers who use these services.	Ho et al. (2020)
Privacy Paradox	• Although customers have concerns about online shopping, they still adopt this behavior. • In what concerns to consumer shopping online, making product recommendations or discounts increases the	Venkatesh et al. (2021)

	effect of privacy enablers on their intention to purchase a specific product

APPENDIX B: MEASURES

Constructs	Items	Question Items	References
Complexity	C1	Using artificial intelligence in digital banking applications will be easy to learn	Davis (1989), Goodhue & Thompson (1995), and Taylor & Todd (1995)
	C2	My interaction with the technology will be clear and understandable	
	C3	The technology will be easy to operate	
	C4	This technology will be convenient and easy to use	
Compatibility	CP1	The technology will be compatible with my lifestyle	Lin (2011) and Taylor & Todd (1995)
	CP2	Adopting this technology will fit well with the way I like to manage my finances	
	CP3	Adopting this technology to conduct banking interactions will fit into my lifestyle	
Self-Efficacy	SE1	If I want to, I will easily operate this technology on my internet banking account	Taylor & Todd (1995)
	SE2	I know enough to use this technology in the future	
	SE3	I will feel comfortable using this technology on my own	
	SE4	Being able to use a service even if no one is around to tell me how to use it is important	
Facilitating Conditions	FC1	Having the use of this technology whenever I want will be important	Taylor & Todd (1995)
	FC2	Having a technology that works with my existing finances management will be important	
	FC3	I believe it will be important to have the time and resources needed to use this technology	
	FC4	I believe I will have the time and resources to use the technology	
Hedonic Motivation	HM1	Using a digital banking technology that uses artificial intelligence will be fun	Allard et al. (2009), Kim & Han (2011), and Venkatesh et al. (2012)
	HM2	Using this technology will be enjoyable	
	HM3	Using this technology will make me feel good	

Utilitarian Motivation	UM1	By using this technology, I will accomplish exactly what I wanted to manage my finances	Allard et al. (2009) and Kim & Han (2011)
	UM2	Compared to the effort I need to put in to manage my finances, the use of this technology will be beneficial to me	
	UM3	Compared to the time I need to spend to manage my finances, the use of this technology will be worthwhile for me	
	UM4	Overall, the use of this technology will deliver me good value	
Attitude Towards Adopting	A1	I like the idea of using a tool in my internet banking account that uses artificial intelligence	Taylor & Todd (1995)
	A2	Using this technology is a good idea	
Perceived Behavioral Control	P1	I will be able to use this technology in my life to manage my finances	Taylor & Todd (1995) and Yi et al. (2006)
	P2	I have the resources, knowledge, and ability to operate this technology	
	P3	The idea of using this technology to manage my finance is wise	
Intention to Adopt	I1	If available, I intend to use a technology like this in the future	Taylor & Todd (1995)
	I2	If I heard about a technology like this on my internet banking platform, I would try to use it in my daily life	
	I3	If available, I plan to use this technology to manage my finances	
Perceived Risk	R1	Using these technologies will be associated with a high level of risk, compared to traditional ways of financial management	Gerlach & Lutz (2021), Kim et al. (2008, 2009), and Ryu (2018)
	R2	By using this technology, I will be exposed to many risks	
	R3	Overall, I think that there is little benefit to use this technology compared to traditional finance management tools	
Perceived Privacy	PP1	The Bank where I will use this technology may collect too much information from me	Kim et al. (2008)

	PP2	This technology will use my personal information for other purposes without my authorization	
	PP3	This technology will use my personal information with other entities without my authorization	
	PP4	I am concerned about the privacy of my personal information during a transaction	
	PP5	Unauthorized persons (i.e., hackers) may access to my personal financial information	
Perceived Benefit	PB1	Using this technology will be convenient	Gerlach & Lutz (2021), Kim et al. (2008, 2009), and Ryu (2018)
	PB2	Using this technology will be time saving	
	PB3	I see many advantages in artificial intelligence technologies in digital banking to manage my finances	
	PB4	By using this technology, I will achieve a higher benefit	
Consumer Trust	CT1	Artificial intelligence technology in digital banking is trustworthy	Kim et al. (2009)
	CT2	This technology gives the impression that it will keep promises and commitments	
	CT3	I believe that this technology and my Bank will have my best interests in mind	
Personal Innovativeness	PI1	If I heard about a new digital banking technology, I would look for ways to experiment with it	Oliveira et al. (2016) and Yi et al. (2006)
	PI2	Among my peers, I am usually the first to try out new technologies	
	PI3	I like to experiment with new technologies	

APPENDIX C: MODERATORS

Constructs	Question Items	Answers
Financial Planning	Are you responsible for your money management?	Yes No
	Have you ever done any type of financial investments?	Yes No
Demographics	Which country do you currently reside?	List of countries
	What is your age?	Numerical values input
	What is your gender?	Male Female Non-binary/Third gender Prefer not to say
	What is your highest educational achievement?	Elementary Education Secondary Education Bachelor's Degree Master's Degree Doctor's Degree

APPENDIX D: VIDEOS

Videos are available through the link Master Dissertation - Introduction videos