Consumer Adoption of Open Banking Products and Services

The influence of psychological ownership of data on consumer adoption of open banking products

Elias Marzouk

"No, it's MY data!"

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Elias Marzouk

Student number: 4438183

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Graduation Committee

Chairperson/ Second Supervisor:	Dr.ir. G.A. Mark de Reuver	Information and Communication Technology
First Supervisor:	Dr. Laurens Rook	Value, Technology and Innovation
Company Supervisor:	Ruben van Wylick	Senior Manager PwC Amsterdam

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Preface

This thesis is my final graduation project for the Management of Technology Master's program at the Delft University of Technology. This thesis was written as part of my internship at PwC Advisory, in the Customer Team Financial Services department. I would like to take a moment to thank everybody who has been part of the process of developing this Master's thesis.

I would like to thank my first supervisor, Dr. Laurens Rook, for all the support and for allowing me to work under his guidance. He provided helpful feedback and had a positive attitude that made working with him an enjoyable experience. Our interaction has always been via screen. This however did not affect the quality of the feedback I received. Furthermore, I will always remember our analysis of football games and the Olympic games. I would also like to thank my second supervisor/chair, Professor Mark de Reuver, for his inputs and criticism which improved the quality of my thesis.

I want to thank my external supervisors, Ruben van Wylick and Thomas Berntsen, who helped me with finding the idea to conduct my research and proactively supported me from the beginning with critical feedback. I am grateful for the opportunity to be part of the PwC Financial Services Customer Team. I am more than happy that I have been part of this team and appreciate the resources and the capabilities offered to me to excel in this project.

Lastly, my family and friends receive my deepest gratitude for their never-ending support during this period.

Executive Summary

Open banking is an evolution driven by new regulations, advance in technology, competition, and change in customer expectations. Open banking is about enabling consumers to share their financial data with authorized third parties in return for more personalized products and services. However, the adoption of open banking products and services is still very limited. Consumers are also not familiar with the open banking environment and are not well informed about the new regulations such as PSD2.

Previous studies have shown that the success of open banking depends on: the safe transfer of the financial data and on the control consumers have over their data. Moreover, literature around the disclosing of financial data has demonstrated that consumers are unwilling to share their data, with privacy concerns being the dominant factor. Further, the new data economy brings a lot of around who actually owns the data and what data ownership leads to.

To explore the adoption of open banking among consumers, this study combined the technology acceptance model with external factors related to consumer personality attributes. Through intensive literature review, three dimensions are identified as crucial: psychological ownership, user's privacy concerns, and technology readiness. A conceptual framework was developed along with nine hypotheses. The data was collected via an online survey. The reliability and validity of all the constructs were assessed. The hypotheses were tested through structural equation modeling using the SmartPLS software.

The results of the analysis indicated that the conceptual model was a good fit. The analysis indicated that there is a strong and significant effect on the intention to use open banking products and services. Specifically, perceived usefulness and perceived ease of use were important predictors for intention to use. Although psychological ownership had a negative effect on the intention to use, it showed a significant total effect through the mediating effects of perceived usefulness and ease of use. While the results of privacy concerns were insignificant, the technology readiness construct registered a total positive effect through the mediating role of the technology acceptance model on the intention to use. These findings allow the understanding of what affects the consumer's intention to use open banking products.

The study supports the literature by being the first study to include the construct of psychological ownership to the technology acceptance model with regards to financial data in the banking industry. The results showed a small negative effect of psychological ownership of data on the intention to use to open banking products and services. Further, the results demonstrated the mediating role of technology acceptance model between the constructs of psychological ownership and the intention to use. These findings implicate that banks should clearly inform their customers the usefulness and ease of use of open banking products and highlight the added value of such products. In addition, banks must raise awareness of PSD2 and the ownership of financial data.

Although the results are quite encouraging, the generalization should not be based on one single study. Future studies could use these findings to explore more the effect of psychological ownership on the disclosing of personal and financial data. Furthermore, by being a pioneer in the topic of open banking, the study provides banks and financial organizations with new insights on the consumers' adoption of open banking products and services.

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1. Introduction

In an increasingly digitized economy, the banking industry is evolving at an accelerating rate driven by continuous technological innovations and major regulatory developments. One such piece of regulations is the Payment Services Directive (PSD2), which intends to further accelerate the achievement of an integrated, competitive, innovative and efficient market for payment services in Europe. Moreover it contributes to a wider industry shift towards an Open Banking environment (Brodsky & Oakes, 2017). Open banking initiatives are becoming increasingly popular around the world. The open banking initiative defines the term "Open Banking" as follows: "*Open Banking enables personal customers and small businesses to share their data securely with other banks and with third parties, allowing them to compare products on the basis of their own requirements and to manage their accounts without having to use their bank*" (Open Banking, 2017; Deloitte, 2021). In other words, the open banking environment relies on the opening of banks' information systems and the sharing of customers' data with third parties. Therefore, it creates new opportunities in product and service creations (EBA, 2016). It is difficult to predict the range of products and services that might be developed and provided by financial organizations in a fully open environment. However, the most noticeable services that could be improved by open banking are: financial product comparison, money management applications and loans or mortgages applications.

As noted above, banks and other types of financial organizations are adopting the open banking environment because of its significant potential and its benefits internally and for the customers. Even though open banking did not attract a lot of academic research, the benefits and opportunities of open banking are discussed throughout the literature (Gozman et al., 2018, Omarini, 2018).

Alongside the described forces, changing consumer behavior and expectations are other major forces in the transformation towards an open banking environment. In fact, in the current internet-based economy, consumers have evolved and their expectations have changed. Consumers expect financial services providers to offer a similar level of experience that is offered by the big-tech companies (Passi, 2018). Specifically, this means that banks should offer services that provide the consumers with what they need, while saving them time and effort (Voss, 2000). There are several factors influencing consumers' decisions to use open banking services. Generally, from the consumer's perspective, an open banking service should be the best option available in order use it and get the benefits out of it. In fact, effective products and services are perceived as being useful and easy to use. They increase consumers' convenience to make use of it.

The potential of open banking products and services crucially rely upon consumers' willingness to disclose their financial data. Considering PSD2, consumers are getting the overall control over their financial data. Therefore it is critical to understand consumers' decision making in the disclosure of financial data. The extant literature that has looked into consumers' data disclosure decisions tend to only focus on privacy concerns as the factor preventing consumers from sharing financial data (Smith et al., 2011). In fact, the feeling of possession, referred to as psychological ownership, can develop a great feeling of attachment to the object (Pierce et al., 2003). This can lead to perceiving sharing financial data as a loss (Culnan & Bies, 2003).

Furthermore, the rapid growth of the data economy has raised questions about who owns data and what data ownership entails. Growing evidence shows that data are capable of ownership (Scassa, 2018). However, the legal framework around data ownership is still ambiguous for most individuals.

1.1 Research Focus & Problem Definition

The research is conducted as a master thesis in Management of Technology at Technical University of Delft. It is also part of an internship at PwC Advisory in Amsterdam, specifically within the Financial Services department under the Customer and Operations (C&O) team. C&O helps businesses in the financial industry to be aligned with their customer's expectations and to become customer centric while using technology in the right way. Therefore this research focuses on the financial services market in the Netherlands.

Despite the initial momentum in the financial market, Open Banking services continue to be fragmented and implemented on small scales (Sinha & Groenewout, 2020). The penetration in daily customer needs, beyond payment services, is still very limited. In fact, a survey conducted by ING showed that 82% of Dutch consumers are still unacquainted with PSD2 (ING,2018). Therefore consumer awareness and trust remain unaddressed for open banking products and services. Regulations and technological capabilities have acted as catalysts for the concept of open banking. However, another crucial emerging force is less familiar: changing consumer behavior. As a matter of fact, there has not been much progress under PSD2 in terms of data sharing (van der Cruijsen et al., 2020). Open banking is as much about innovating financial services as it is about the customers. In fact, the great challenge is to develop products and services that are needed and expected by the customers. After all, consumers only use products that add value to them and meet their relevant needs.

Studies that have focused on the adoption of new technologies (Buyle et al., 2018; Pikkarainen et al., 2004; Shin & Lee, 2014), have applied the Technology Acceptance Model (TAM) proposed by Davis (1989). TAM is based on the theory of reasoned action. The model suggests that two particular beliefs: perceived usefulness and perceived ease of use directly influence the technology acceptance behavior. TAM has been tested and validated many times in different industries and sectors. However, Legris et al. (2003) stated that results from using the TAM were not consistent and that some factors were missing in the model. The authors suggested a broader model which includes variables related to human and social change processes (Legris et al., 2003). Another model used when assessing new technologies is the Technology Readiness (TR) developed by (Parasuraman, 2000). TR considers individual differences and people's propensity to embrace new technologies (Parasuraman & Colby, 2015). The TAM construct is system specific while the TR construct is more individual specific.

Besides, the psychological ownership of data is being considered as important in the context of open banking (Scassa, 2019). The construct of psychological ownership derives from organizational behavior research, and refers to individuals' feeling that a target is theirs (Pierce et al., 2003). Studies have demonstrated that individuals can generate possessive feelings with objects of choice (Van Dyne & Pierce, 2004). However, the construct has not yet been used in the context of personal and financial data. There is a need to understand the psychological ownership of data from the consumer perspective.

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Considering the importance of the financial data in the open banking context, privacy concerns are also an important factor influencing the intention to use. The Internet User's Information Privacy Concerns (IUIPC) developed by (Malhotra et al., 2004) is one of the most common frameworks used to assess privacy concerns. Consumer's privacy concerns are affected by external conditions such as industry, cultures, or regulatory laws (Culnan & Bies, 2003). In the information privacy literature, much research has concentrated on consumer willingness to share data (Xu et al., 2009; Norberg et al., 2007), however to date, there are little studies that have focused on the degree to which these intentions affect the consumer behavior and if there are other factors that influence this relationship.

While TAM appears to be a good predictor for the intention to use open banking products and services, relying on one single measure on its own as an intention to use indicator is imprecise. In order to provide a more accurate assessment of the use of open banking services, the study combines the attributes of the open banking products and services with the consumer psychological attributes (Figure 1). Altogether, they influence the consumers' decision in using open banking products and services. Understanding how the evolution towards an open banking environment affects consumer behavior and how changing consumption is creating new opportunities to cultivate psychological ownership of data, will be key to effectively improve consumer welfare and promote innovation in the banking industry.
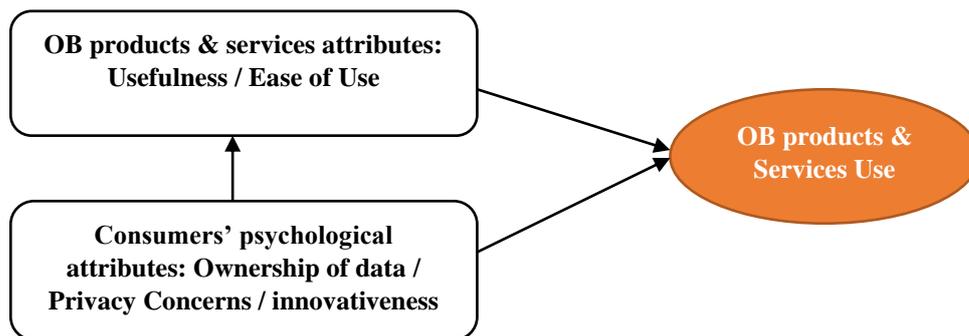
Figure 1 - Research Focus

1.2 Research Objective

Based on the previously discussed research focus and problem definition, the objective of this study is to develop a model that is used to assess the intention to use open banking products and services. With the model, the aim is to explore consumer's intention to use open banking products and services as well as their psychological ownership of financial data and how this feeling of ownership influences their adoption of open banking. Further, to maximize the potential of open banking, the effect of psychological ownership on the intention to use mediated by the TAM and by IUIPC are also explored.

1.3 Research Questions

Based on the research problem and objectives presented, the following main research question of this research is identified:

To what extent do internet users' privacy concerns and technology acceptance model mediate the relationship between psychological ownership and the adoption of open banking products and services?

In order to answer the main research question, the study is divided into sub sub-research questions which will be answered first. They will help form the structure of the thesis and answer the main research question. Therefore the following sub-research question are formulated:

1. What is the use intention of open banking products and services among consumers
2. To what extent does psychological ownership of data influence the consumer intention to use open banking products and services?
3. To what extent do concerns about information privacy influence the consumer adoption of open banking?
4. To what extent does the technology acceptance construct mediate the relationship between technology readiness constructs and the intention to use open banking products and services?

1.4 Research Approach

In order to conform with the research objective, a four-phase research approach will be followed as shown in Figure 2.

Phase 1	Literature Review	Get deeper insights into the open banking environment and identify the most important and relevant constructs that will determine the consumers' use intention.
Phase 2	Develop conceptual model	Based on the literature review, construct the conceptual model and develop the associated hypotheses.
Phase 3	Questionnaire Survey	Develop an online questionnaire survey and obtain the perceptions of the respondents.
Phase 4	Results & Discussion	Analyze the results obtained from the survey and interpret the major findings to answer the main research question

Figure 2 - Research approach

First, literature research will be to cover the early stage of the research. The relevant papers, articles and studies related to the topic will be reviewed. In addition, from the existing studies, the most important and relevant constructs will be chosen to assess the adoption of open banking. Second, based on the literature review, a conceptual model will be developed and the hypotheses will be formulated. From this, the third phase is the design of a survey questionnaire. Survey research is chosen to conduct the following study because it is a time and cost-effective approach to measure intended behavior, knowledge, and attitudes from or about people (Sekaran & Bougie, 2010). Meanwhile, surveys allow researchers to create a solid representation of the real world that enables them to manipulate situations or questions and to

analyze the differences in behavior (Gaines et al., 2007). The statistical results obtained from the survey will be discussed and interpreted to answer the main research question of this study.

1.5 Report Structure

The following report is structured as follows. This chapter has introduced the notion of open banking and discussed the objectives of this study. The following chapter presents and discusses the literature that underpins the following study. From this, Chapter 3 follows with the proposed model with the associated hypotheses. Chapter 4 presents the methodology along with the research procedure and the measurements instruments. Chapter 5 will visualize the results of the research. Chapter 6 will analyze and discuss the major findings of the results and will present the scientific and practical implications. Finally, the conclusion is presented in Chapter 7.

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2. Literature Review

This chapter presents the literature review with theoretical concepts, theories, and models relevant to the following thesis research. The literature review will lay out the theoretical background to support the study and the development of the conceptual framework.

The following literature review starts with background information on the changing financial market environment. Second, it explores the emergence of new types of platforms within the financial industry. Third, a review of the state-of-the-art literature on consumer's willingness to share their data with financial companies will be conducted. Finally, the importance of user's information privacy and their psychological ownership of data in disclosing personal data will be discussed. By acquiring and analyzing relevant literature, a knowledge gap may be determined which will be the starting point for the following research.

2.1 Changing Market Environment

The financial industry is currently undergoing a revolution. This revolution impacts how the industry develops and offers new types of products and services. Three factors at play: customer expectations, competition, and technology forcing the inevitable change in the industry, in addition to new regulations acting as catalysts to encourage this change.

The old regulatory framework that used to act as a barrier to the banking industry no longer seems to work. Regulators are beginning to realize the need to have a relaxed regulatory environment in order to increase competition and enlarge the customer choice and efficiency in the financial market (Nicholls, 2019). Therefore changes in regulation look set to open up the banking industry and accelerate the pace of innovation. The EU has put effort into introducing a legal framework for data-sharing within the financial sector (Borgogno & Colangelo, 2019). In fact, two legislative initiatives were introduced, the General Data Protection Regulation (GDPR) with a general data portability scope, and the Second Payment Service Directive (PSD2) which is more sector-specific access to account data rules. The new regulation is looking to increase competition and innovation by opening up customer and banking data to Fintech's and third party providers.

Furthermore, customer expectations in the financial services industry are being determined by their experiences in other industries that are further along the digital curve (Deloitte, 2017). The ongoing digital transformation in the retail environment and in commerce, are the main causes behind the change in consumer behavior. Consumers expect more intelligent and contextual services in their daily interactions with their banks (Deloitte, 2017). They also expect their banks to understand them and offer them services and products based on their past behavior and preferences (Rana et al., 2017). In addition, Millennials have come into the market which caused a fundamental demographic shift. They are characterized by expecting full services digital banking, are far from loyal to incumbent banks, and trust tech brands to offer better services.

That is not all. Technologies such as AI, IoT are pervading the financial industry (Dimachki, 2018). Further, most of the current innovations within the financial industry are enabled by using Application Programming Interfaces. APIs appear to be the heart of the Fintech revolution. In fact, APIs enable banks or other financial organizations to incorporate third-party data or services into their applications and products (EBA, 2016). The use of API

has grown remarkably especially within the financial industry. This explains the changing of customer demand for connected services and the rise of digital forms of payments. APIs have become increasingly scalable and monetized (Milanesi, 2017). This trend will likely continue to experience growth in the coming years.

The EU's pro-innovation regulatory environment and advances in digital technology have driven a big increase in the number of financial technology firms (Deloitte, 2017). The impact of Fintech innovation is huge, as it covers almost every aspect of the financial value chain involving the entire banking sector as well. Within the financial services industry, the most successful innovations are those with the ability to make use of customer data and that are easily deployed across different platforms (Deloitte, 2017). The Fintech movement has raised concerns about the viability of bank's traditional business models. This has led the financial industry to reconsider the role of banking and finance (Omarini, 2018). Further, large technology firms, including Google, Apple, Facebook, and Amazon (GAFA) have entered the financial services market. The GAFA companies offer payment platforms to their users, such as Google Pay or Apple Pay. However, incumbents are also in position to enhance customer experience and develop new innovative products and services. Models and practices of giant tech firms are diffusing to incumbent finance companies, which is referred to as the *Appleization* of finance by Hendrikse et al. (2018).

2.2 The Emergence of Platforms Within the Banking Sector

The newly-introduced regulatory frameworks, changing market environment, and the opening up of APIs offer unique opportunities to apply some new concepts and new business models across the financial industry and banking sector. Nevertheless, these emerging forces and the implementation of the PSD2 is accelerating financial organizations to move towards open digital platforms.

In the following subchapter, the platform economy within the financial industry is described. Additionally, the openness of such platforms in the banking industry is discussed with a clear focus on open banking.

2.2.1 Platform economy

There are different definitions and understandings for the term platform as a unit of analysis (Schreieck et al., 2016). A platform is defined as "a sociotechnical and business arrangement which is characterized by an intermediary position regarding the data production" (Langley & Leyshon, 2017, p.3). In another study, Parker et al. (2016) defined a platform as a new business model that uses technology in order to connect people, organizations, and resources in an interactive ecosystem where large amounts of value can be created and exchanged. This puts the sociotechnical aspect of a platform at the center of this new business model, where value is extracted from the intermediation and the creation of multi-sided markets. During the last decade, there has been a growing attention from researchers into platforms (Gatautis, 2017; de Reuver et al., 2018; Ondrus et al., 2015).

For a platform to be successful, it has to reach a critical mass of users (Evans & Schmalensee, 2010), in addition it has to have a high level of trust and it should be easy to use (Venkatesh et al., 2003). Furthermore, benefits of the platform increase for the users as a function of the total platform users. Within the financial industry, Hendrikse et al. (2018) argues that platform models and practices are diffusing from tech firms, such as the GAFA

companies, to incumbent financial organizations. In fact, payment platforms such as PayPal, Apple Pay and Google Pay are emerging and disrupting the marketplace (de Reuver et al., 2018). These companies specializing in payment systems, crowdfunding, and P2P lending correspond with the platform business model (Langley & Leyshon, 2021). Such types of services create multi-sided markets and intermediate between users.

On the other hand, financial companies that offer online banking, financial planning and management, and investments are viewed as business-to-consumer platforms that relate between consumers and product providers (Langley & Leyshon, 2021). In addition, many other actors do not have the corresponding financial license, however they do act as an intermediary platform between financial incumbents and other payment platforms, such as PayPal.

2.2.2 Open Banking

It goes without saying that the introduction of PSD2 in the EU marks an important step towards applying the platform business model in the financial environment and especially the banking sector. The new legislation shifted the property of data from bank to customers and opened up the payment and other banking services to TTP (Omarini, 2018). This has given rise to a new type of banking environment, defined by the notion of "Open Banking". Open banking could transform a bank's traditional business model to a narrower platform business model.

Open Banking associates to the "open innovation" literature as banks depend on the stream of inside and outside ideas to develop innovative products and services. Through open banking, banks can offer existing products and services in new ways or in collaboration with third parties (Omarini, 2018). Open banking is defined as "banks which either voluntarily or in response to legislative or regulatory requirements, provide access to customer information in secure, digital form – with the customer's express consent – to third party providers" (Nicholls, 2019, p.2). Hence open banking is based on three key factors: customers having more control over their financial data, financial organizations being forced to share customer data with customers, and, with the consent of the customer, financial organizations need to share customer data with TTPs (Leong, 2019). The success of open banking depends on a two-building block. First the transaction data needs to be safely shared, controlled and stored by financial institutions and third party providers. Second, as customers are at the central stage of this new type of banking, the control a customer has over their banking data is critical in an open banking model, given that it is supposedly a customer centric evolution where customers can get the maximum benefit out of their financial data (Leong, 2019).

In the open banking model, the confidentiality of customer information is still relevant, however the focus has shifted to how a consumer is able to control the flow of her data and therefore maximize its beneficial use. Moreover, customer's banking data are no longer considered as mere by-products for using banking services, but as valuable resources which can be used by the customers to maximize benefits occurring to them.

2.2.2.1 Four Roles

Within the notion of open banking, Gozman et al. (2018) identified four generic roles in retail banking: integrator, producer, distributor, and platform. Most of the larger financial incumbents are already playing the role of integrator, producer or distributor, whereas the role of platform is still not adopted and is still at the early stage of development (Gozman et al., 2018).

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Integrator: Within the integrator role, the bank has full control over the whole value chain and over the customer experience. It opens information only to the extent it is requested to do under the regulations. All the products and services are created in house by the bank and distributed through their online and mobile channels to the customers. Moreover, the bank also controls the underlying infrastructure. The integrator role is the current dominant role in today's retail banking.

Producer: The producer role consists of a minimum of two parties; the bank and third party providers. The service or product is created by the bank, while the third party, such as fintech or BigTech, distributes the services to the customers. This leads to ambiguous situations regarding the customer ownership for the parties involved. This is especially for third-parties that focus on the end consumer. Whereas, the other third-parties that provide B2B services, customer ownership remains with the bank. For instance, with the new PSD2 regulation, banks move more the integrator to the producer role especially regarding the account information and payment initiation services.

Distributor: This role is more an instrumental strategy. By opening up, banks can also take the opportunity to extend their market presence by distributing third parties' services to customers. This means that banks would offer third-party products and services through their own channels. This is already the case with payment service of card schemes. However, this role has similar challenges as to the producer role regarding customer ownership.

Platform: As a platform, banks can offer different services and products such as, matching of parties, Know Your Customer, and Anti Money Laundering (Gozman et al., 2018). In fact, this role is specified through banks acting as a facilitator for third parties and their customers. It is worth stating that banks already have a good starting point and hold an important asset, which is their customers personal and financial data to feed the platform. The next step for banks to do will be retaining users. The role of the platform is ideal when the market environment becomes more complex and actors have to seek collaboration to improve customer value (Omarini, 2018). However, the platform business in the financial industry still has to be developed further.

2.2.2.2 New business models

Two predominant business models are emerging: banking as a platform and banking as a marketplace (Accenture, 2020; Milanesi, 2017; Zachariadis & Ozcan, 2016). Both models are still at a very early stage of development in the banking sector. For a bank to operate as a marketplace or a platform, it should completely reinvent itself in the open banking era in order to build a more valuable relationship with the consumers.

In the banking as a marketplace model, a bank combines its traditional services along with new products and services from third parties providers. This offers the banks to expand its offerings beyond financial services and engage more deeply with its customers. Whereas in the platform scenario, a bank develops its own set of open APIs that any third party provider is able to use in order to build upon other services and products. Although a platform business model in the banking sector can be highly innovative and attractive, it is still ambiguous whether the conditions will favor such an approach to be implemented in the banking sector. As a platform service provider, the success will depend heavily on the customers' disclosure of their financial data.

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2.3 Willingness to Share Data

As the digitization of the banking sector proceeds, online banking, mobile banking, or banking via interconnected devices such as smartwatches are becoming ubiquitous. This type of banking results in massive amounts of data of every day usage. The availability of personal and financial data provides many opportunities for FinTech's and business model innovation within the financial field. However, exploiting these data relies upon consumers' willingness to share their data. Therefore it is important to understand consumers' acknowledgments in the decision making process.

Many models that explore consumers' decision in sharing their private data focus on privacy concerns as the dominant factor that prevent them from sharing their personal data (Smith et al., 2011; Li, 2011). However, it would be very simplistic to suppose that the absence of privacy concerns will lead to higher willingness to share personal data. In fact, consumers appreciate the value of being in control of their personal data (Cichy et al., 2014). This is because a human needs to experience the possession of tangible or intangible targets (Belk, 1988). Those feelings of possessions are referred to as psychological ownership.

2.3.1 Information Privacy

In a world of digitalization, big data, and a widespread interconnection between individuals and organizations through different devices, the field of informational privacy research is receiving attention from many scholars (Culnan & Bies, 2003; Smith et al., 2011; Kokolakis, 2017, Malhotra et al., 2004). Westin (1967) defines information privacy as the ability of individuals to control the terms under which their personal information is acquired and used. In the current marketplace, privacy appears an important problem because of the tension between organizations and consumers' interests. Companies are collecting, storing, and using personal information in order to remain competitive while consumers agree that some methods of their personal information is a violation of their privacy (Culnan & Bies, 2003).

A holistic framework drawing upon the "privacy calculus" was suggested in order to understand individuals' disclosure decisions to share personal information (Xu et al., 2009). The framework considers that consumers perform a cost-benefit analysis when evaluating the results of sharing their personal information against the perceived costs. For example, when consumers are comfortable with the process by which their data is used and managed, they are less worried about their privacy. Xu et al (2009) introduce in their research three categories of privacy benefits: financial rewards, personalization, and social adjustments. The costs of sharing personal data point to the potential risk of data loss, the misuse of personal data, or the potential of privacy breach (Malhotra et al., 2004). Furthermore, privacy is considered the most influential factor on consumer's willingness to share personal data (Malhotra et al., 2004). However, Norberg et al. (2007) argued in their study that privacy is a highly contextual phenomenon and that individuals demonstrate different behaviors in different contexts.

Many studies related to the notion of the 'privacy paradox' state that consumers express strong privacy concerns but act in a contradictory way to these concerns (Kokolakis, 2017). In addition, Norberg et al (2007) stated that it is possible that individuals' stated intentions are not always in line with their behavior. This confusion arises from incomplete and asymmetric information. In fact, consumers are often unaware of what data they are sharing and how they can make use of it.

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Concerning the financial data, Smith et al. (2011) reviewed privacy-related research papers and concluded that there are relatively few studies on the privacy and the sharing of financial data. Studies that researched the relationship between financial incentives and privacy have shown that putting a price on privacy is extremely complex. In fact, privacy is valued more when people have it compared to when they have to pay for it (Acquisti et al., 2013). Further, Schuh and Stavins (2016) showed that the adoption and use of payment instruments depend positively on the perceived security of personal information.

2.3.2 Internet User's Information Privacy Concerns

One of the most widely conceptual frameworks for privacy is the Internet users' information privacy concerns (IUI

PC). The 10-item scale was developed by adapting questions of the precedent 15-item scale Concern for Information Privacy (CFIP) developed by Smith et al. (1996). Both scales draw upon the overall information privacy concerns, however IUIPC taps into the problem more from an angle of social theory and justice theory. The IUIPC evaluates the perceived trade-offs between the individuals and the external party that makes use of the data (Rook et al., 2020).

Even though the concept of information privacy sounds to be straightforward, the practical boundary of it in real life varies according to various external factors such as: industry sectors, cultures, and regulatory laws (Culnan & Bies, 2003). Individual privacy concerns will be highly influenced by these external conditions. However, an individual's perception of such external conditions will also vary with personal characteristics and individual past experiences (Donaldson & Dunfee, 1994). Therefore, consumers generally differ in their opinions and concerns about organizations' collection and use of their personal data (Malhotra et al., 2004).

Malhotra et al. (2004) characterize the notion of IUPIC in terms of three factors: collection, control and awareness of privacy practices. Collection is defined as the degree to which an individual is concerned about the amount of personal data possessed by others relative to the value of benefits received (Malhotra et al., 2004). The control factor represents the freedom to voice an opinion or exit and is one of the most important factors in the model of IUIPC (Malhotra et al., 2004). In their research, Dinev & Hart (2004) showed that if individuals have a greater sense that they control the use of their information, they will have less privacy concerns. Other researchers reported similar findings. Information disclosure increases when people perceive they have more control over their information (Keith et al., 2013, Knijnenburg et al., 2013). Nowadays, most financial institutions offer consumers control over their personal information by giving the options to opt-out or to not give consent. Lastly, the awareness factor refers to the understanding about established conditions and actual practices such as data collection and other issues (Malhotra et al., 2004). Individuals who are aware of the regulations and of what happens with their data for example, are more likely to have lower concerns for privacy than individuals who are not aware (Culnan, 1995). The IUIPC conceptual framework focuses on the perception of fairness and justice which makes it flexible enough to be adapted to any technical changes that may occur in the future and robust against technological innovations (Malhotra et al., 2004).

Furthermore, Malhotra et al. (2004) developed a model to demonstrate how IUIPC influences consumers' decision in sharing personal data. The model is developed based on the

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trust-risk framework (McKnight et al., 1998) and the theory of reasoned action (Fishbein & Ajzen 1975).

2.3.1 Psychological Ownership of Data

Psychological ownership can be defined as "a state where an individual feels as though the target of ownership or a piece of that target is theirs" (Pierce et al., 2003, p.5). Psychological ownership is, in many ways, a valuable asset, it satisfies important consumer motives and has value-enhancing consequences. The feeling that an object is 'mine' enhances the attitude toward the object, strengthens attachments to it, and increases its perceived economic value (Shu & Peck, 2011). In fact, psychological ownership differs from legal ownership. Legal ownership is formally recognized by the society and protected by the legal system, whereas psychological ownership is recognized by the individual's own feelings (Pierce et al., 2003). Hence, people can have high psychological ownership for objects they legally do not own, or have a low psychological ownership for objects they legally own. Thus legal ownership is not a condition for psychological ownership.

Additionally, Isaacs (1993) argued that a sense of ownership can also be experienced in regard to nonphysical targets such as ideas, creative endeavors, and more recently personal data (Anderson & Agarwal, 2010). However, the concept of data ownership is still complex. While data may be defined as an asset, there is still difficulty in defining it as a property that is capable of ownership (Leong, 2019).

Moreover, Pierce et al. (2003) argued that psychological ownership fulfills three human motives: efficacy, self-identity, and place. Efficacy is a general human need to feel capable of interacting effectively in a setting. Thus, possessions facilitate the feeling of control and influence over an object. Self-identity represents people's need to have a clear sense of themselves through their possessions. Finally, place refers to the basic need to have a sense of belonging which makes people feel secure and comfortable.

Psychological ownership was used in different research areas. Originally, it was applied in the research of organizational behavior to show the psychological ownership of people for organizations they do not own (Van Dyne & Pierce, 2004). The concept was also applied in other research areas such as consumer behavior (Shu & Peck, 2011; Morewedge, 2021). More interestingly psychological ownership has been applied on the willingness to disclose personal data (Cichy et al., 2014). Data and data ownership are crucial in the new financial world. The study has shown that feelings of ownership might play an influential role in the decision making process of sharing personal data (Cichy et al., 2014). In fact, there is a negative relationship between psychological ownership and the disclosure of personal data.

2.3.2 Sharing Financial Data

In the new data economy, there is still a lot of ambiguity around who owns the data and what its ownership leads to. Recently, data have shifted from being a by-product to being a resource in their own right (Scassa, 2018). Today the platform models, coupled with the increase in personal devices such as wearables, indicate that financial data can be associated with other data points: location, likes, social connections, purchases, birthdate, and many other personally identifiable information.

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Studies have shown that the willingness to share financial data is low compared to other types of data (Bijlsma et al., 2020; van der Cruijsen, 2017). In her study van der Cruijsen (2020) examined consumers' attitudes towards payments data usage by presenting them with different situations and, in each situation, asking them to what extent the use of payment data is acceptable. The author concluded that consumers' attitudes depend on the purpose of the data use. In fact, most people support payment data usage to enhance safety but do not support the use of data for commercial usage, especially when the company using it is other than the consumer's own bank. In addition, Bansal et al. (2016) argued in his study that the extent to which an individual is prepared to disclose financial information to a finance website is positively related to the degree of trust the consumer has in that specific financial institution. In line with these studies, Stavins (2018) used a diary for US consumers which showed that consumers are insensitive to financial incentives.

Furthermore, Bijlsma et al. (2020) studied the willingness of consumers to share their payment data with Payment Service Providers (PSPs). They found out that most people are unwilling to agree with the usage of their payment data by any bank or any newcomer. Interestingly, people with higher self-reported knowledge of PSD2 were more hesitant to use new services than people with less PSD2 knowledge. These findings suggest that information on PSD2 should strike the balance between informing people well about the possibilities that PSD2 offers to them and how they can mitigate any risks associated with sharing their payments data with PSPs. In fact, there is a complex balance to maintain: educating and empowering consumers without scaring or confusing them (Brodsky & Oakes, 2017). Moreover, the authors argued that pricing matters for the adoption of Account Information Services (AIS). In general, if needed and there are no financial incentives, consumers would select their own bank as a service provider. However, if other banks, FinTech's or BigTech's offer against more favorable financial conditions than their own bank, part of the consumers will switch towards the providers with the more financial conditions. Therefore, the authors conclude that consumers' demand for PSD2 services turns out to be sensitive to prices (Bijlsma et al., 2020).

2.4 Technology Acceptance Model

Technology acceptance is an important topic in this dynamically changing environment within the financial sector. In addition, technology is one of the key drivers for the success of any business model. One of the most known models used to assess the effectiveness of new technologies is the Technology Acceptance Model (TAM), developed by Davis (1989) for understanding the influence of technology adoption.

Initially, Davis (1985) suggested a model in which the actual usage of a system is a response that can be explained by user motivation, which in turn is influenced by external stimulus containing the system's characteristics (see Figure 3).
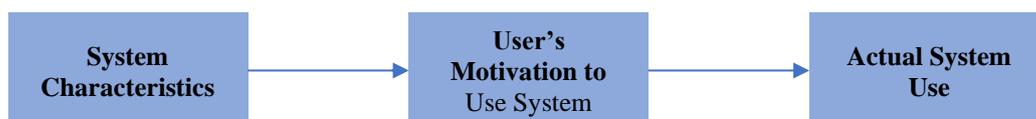

Figure 3 - Conceptual Model for Technology Acceptance

Further on, Davis (1989) cleansed his conceptual model to introduce the TAM model. The model is influenced by the belief of use regarding three factors: Perceived Ease of Use (PES) and Perceived Usefulness (PUF), and Attitude towards using (Davis, 1985). Perceived

ease of use is defined as the 'the degree to which a person believes that using a particular system would be free from effort' (Davis, 1989, p.320). Perceived usefulness is defined as the 'degree to which a person believes that using a particular system would enhance her job performance' (Davis, 1989, p.320). However, several research studies that applied the TAM model as a theoretical framework, found that attitude did not fully mediate the effect of perceived usefulness and perceived ease of use on the actual behavior (Davis, 1989; Venkatesh & Davis, 1996). Building on these findings, a parsimonious TAM model was proposed without the attitude construct from the previous model. Indeed, by removing the attitude construct, any unexplained direct influence noticed from the system characteristics to the attitude variable are eliminated.

The TAM model was used in several studies to assess the intention of using internet banking (Kesharwani and Bisht, 2012; Marakarkandy et al., 2017). In addition, the model has also been applied in studies to determine the consumer intention to use mobile banking (Luarn & Lin, 2015; Akturan & Tezcan, 2012; Munoz-Leiva et al., 2017) and the intention to use smartphone applications (Verkasalo et al., 2010). The model has been validated and used many times in different contexts as mentioned above, and has been preferred by some researchers. Yet, the model has also been criticized stating that it has several shortcomings. Legris et al (2003) argued that TAM should be introduced to a broader model which include variables linked to human and social changes. Therefore, TAM must be associated with additional constructs for a stronger model.

2.4.1 Extensions of TAM

One of the most important extensions brought to TAM is the proposition of the TAM2 model by Venkatesh and Davis (2000). The authors identified that the original TAM model showed some limitations in explaining the reasons for which an individual would perceive a system as useful. Therefore, they proposed additional variables that could be added as antecedents to the perceived usefulness variable. The new model incorporates additional general determinants including social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, results demonstrability, and perceived ease of use). In addition, the model incorporates two moderators: experience and voluntariness. (Venkatesh & Davis, 2000).

Venkatesh and Davis (2000) argued that the core theoretical argument underlying the role of cognitive instrumental processes is that part of an individual's judgement of the perceived usefulness of a system is by cognitively comparing what the system is capable of doing with what they need.

Another important extension of the TAM model is developed by Venkatesh (2000). Building on the anchoring and adjustment framing of decision making, he developed a model with determinants of perceived ease of use. The author argued that individuals develop early perceptions of perceived ease of use of a system regarding several anchors related to individuals' general beliefs about computers and computer use. The anchors proposed by Venkatesh (2000) are: computer self-efficacy, computer anxiety, and computer playfulness, and perception of external control.

At long last, TAM 3 was developed by Venkatesh and Bala (2008). The model is an integrated model that combines the TAM2 model and the model of the determinants of

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perceived ease of use. TAM 3 presents a complete nomological network of new determinants of individuals' technology adoption and use.

2.4.2 Comparing the Models

The three models: TAM, TAM2, and TAM3 have been used a lot over the years by various researchers to explain the adoption of a specific technology. TAM2 and TAM3 are extensions to the original TAM model. They both incorporate social determinants to the perceived usefulness and perceived ease of use constructs in order to explain better the reasons why an individual perceives a technology as useful. The ambition of TAM2 was to keep the original TAM intact and include new determinants to the perceived usefulness construct to understand how the effect of these determinants changed with increasing user's experience over time (Venkatesh & Davis, 2000). On the other hand, TAM3 added determinants to the perceived ease of use and usage intention constructs (Venkatesh & Bala, 2008).

TAM2 by Venkatesh and Davis (2000) and TAM3 by Venkatesh and Bala (2008) were not selected for this study since the research is about new products and services brought by open banking to be implemented in the marketplace. In addition, subjective norms such as society were not required for this study involving the novelty of the technology. Moreover, Davis et al. (1989) explained that social norms scales had a very poor psychometric standpoint, and might not exert any influence on consumers' behavior intention, especially when the technology is a single platform, personal and its usage was voluntary. TAM2 and TAM3 both include social influence, therefore the models were not favorable to study open banking technology and they will not be used for the research.

2.5 Technology Readiness

Technology readiness (TR) is a model developed by Parasuraman (2000) that entails the tendency of customers to grasp and use a new technology. Technology readiness is defined as "people's propensity to embrace and use new technologies for accomplishing goals at home, life and at work" (Parasuraman, 2000, p.308). The model consists of four factors: optimism and innovativeness which are drivers for technology readiness and discomfort and insecurity which are drivers against technology. Parasuraman (2000) has defined these four elements as follows. Optimism refers to a "positive view of technology and a belief that it offers people increased control, flexibility and efficiency in their lives" (Parasuraman, 2000, p.311). Innovativeness means "a tendency to be a technology pioneer and thought leader" (Parasuraman, 2000, p.311). Discomfort can be defined as "a perceived lack of control over technology and a feeling of being overwhelmed by it" (Parasuraman, 2000, p.311). Lastly, insecurity is defined as "distrust of technology, stemming from skepticism about its ability to work properly, and concerns about its potentially harmful consequences" (Parasuraman, 2000, p.311).

In general, consumers can have different attitudes towards a new technology. Thus positive and negative feelings about a technology can co-exist (Parasuraman, 2000). The initial version of the TR model had 36 different items. However, with the rapid changing environment, the scale was no longer up to date and innovative. In fact, there was a need to make the scale more adaptable to the innovative and changing technology environment. Therefore, a new version TR 2.0, with 16-item scale was updated by Parasuraman and Colby (2015). TR 2.0 simplifies understanding the dynamics behind the embracing of new

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technologies. Individuals scoring high on TR are known to be "the explorers". They are interested in new technologies with minimal help (Parasuraman & Colby, 2015). On the other hand, individuals who score low on TR are identified as "the avoiders". They are more convinced with basic technologies and they need more assistance and support (Parasuraman & Colby, 2015).

2.5.1 TRAM Model

The TRAM model is an integration of the Technology Readiness and Technology Acceptance Model developed by Lin et al, (2007) to test the applicability of TAM model in non-working settings. The TRAM model enhances the applicability and explanatory of both the TAM and TR models in marketing settings (Lin et al., 2007). TAM is more system specific and TR is more individual specific. TRAM enhances the applicability and explanatory ability of both models in marketing settings. Shin & Lee (2014) have used the TRAM model to study the NFC mobile payment services and established that a consumer TR has influence on PU and PEOU. In addition, Guhr et al. (2013) also used TRAM to assess the adoption of m-payments and found that TR has an effect on the PU and PEOU.

2.6 Conclusion

In this chapter, the changing financial environment and the background of emerging new types of platforms within the banking industry were discussed. The emergence of new technologies and players such as Fintech's, along with a favorable regulatory framework is transforming the banking sector.

Open banking is currently finding its way to the Dutch banks and other financial organizations. This new aspect of banking fits well in today's sharing economy in which financial companies are looking for ways to activate the value of data. This can be done through open banking where the range of financial products and services could be expanded.

Platform services depend on the disclosure of information by customers. Important constructs that seem to play a role in this new type of banking are: customers' information privacy concerns and their need for psychological ownership towards their data. Those two constructs impact the extent to which consumers will accept and adopt the products and services of open banking technologies or not.

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3. Conceptual Framework

This chapter presents the research gap, the conceptual framework applying the models identified in Chapter 2, and the list of hypotheses.

3.1 Literature Gap

To the author's best knowledge, it appears that there are no studies that have researched the adoption of open banking products and services. In fact, as mentioned in Chapter 2, there are several studies that assessed the adoption of new banking products and systems (Luarn & Lin, 2004; Acheampong et al.,2017; Marakarkandy et al., 2017; Munoz-Leiva et al., 2017). However, it is important to note that their models were basically focused on assessing the system's attributes without considering other variables related to the customers. There are a few customer-centric studies in the banking industry that used a model to assess the adoption of a new product or system (Guhr et al., 2013; Shin & Lee 2014). Moreover, there is a lack of studies that measure all the aspects which were previously presented in Chapter 2.

While the interest in psychological ownership in consumer behavior is increasing, the notion of psychological ownership has received little attention in the information system and financial services literature. The construct has been used in different contexts, such as car sharing services (Paundra et al., 2017), or in organizational settings (Mayhew et al., 2007). Further, psychological ownership of data is recognized as an important issue of data management in the open banking environment (Scassa, 2019). In addition, the emergence of platforms in the financial industry will further complicate the question of ownership as the relationship between the consumer and their data are becoming more varied (Morewedge et al., 2021). In general, psychological ownership has been studied in other domains but not with regards to data. Therefore behavioral consequences of psychological ownership should be explored more fully.

Likewise, some of the proposed models have been extensively used and empirically validated such as the Technology Acceptance model (Davis, 1989). However, researchers argue that these models have to be extended to produce more accurate outcomes for explaining the studied phenomenon (Ajibade, 2018). The study is aimed to assess the consumers' intention to use open banking products and services, including both the system's attributes and consumers' perceptions. Therefore the TAM model should be extended with constructs such as psychological ownership, technology readiness, and privacy concerns as TAM only explains the use action. Further, TAM suggested that PU plays a mediating role between external factors, and user' intention to use. A good example of an external factor in this study is psychological ownership of data. In summary TAM cannot sufficiently answer the proposed research question. Therefore the TRAM model will be used which explicitly combines both attributes: system and individual. In addition, psychological ownership of data will be added as an external factor to the model and the effect of users' privacy concerns on the intention to use is also considered.

Figure 4 shows the graphical framework, in which the four concepts are combined, delineating a new area of research focused on the influence of the psychological ownership of

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data, the privacy concerns, technology acceptance, and the technology readiness on the adoption of open banking technologies.
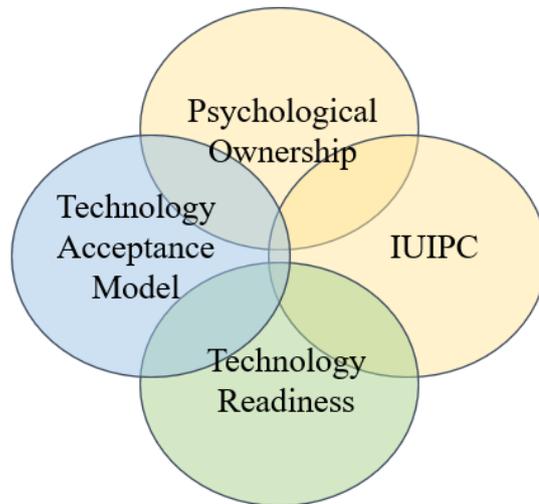
Figure 4 - Identified Framework

3.2 Conceptual Framework

Based on the following theoretical background, a conceptual framework is developed. The framework includes the models identified in Chapter 2. It combines Psychological ownership, TAM, IUIPC, and TR to explain the intention to use open banking products and services. The present research will determine if consumers' adoption of open banking by sharing their financial data is influenced by the notion of psychological ownership of data. Next, the TAM model and IUIPC mediate the relationship between both variables. The model is shown in the following figure.
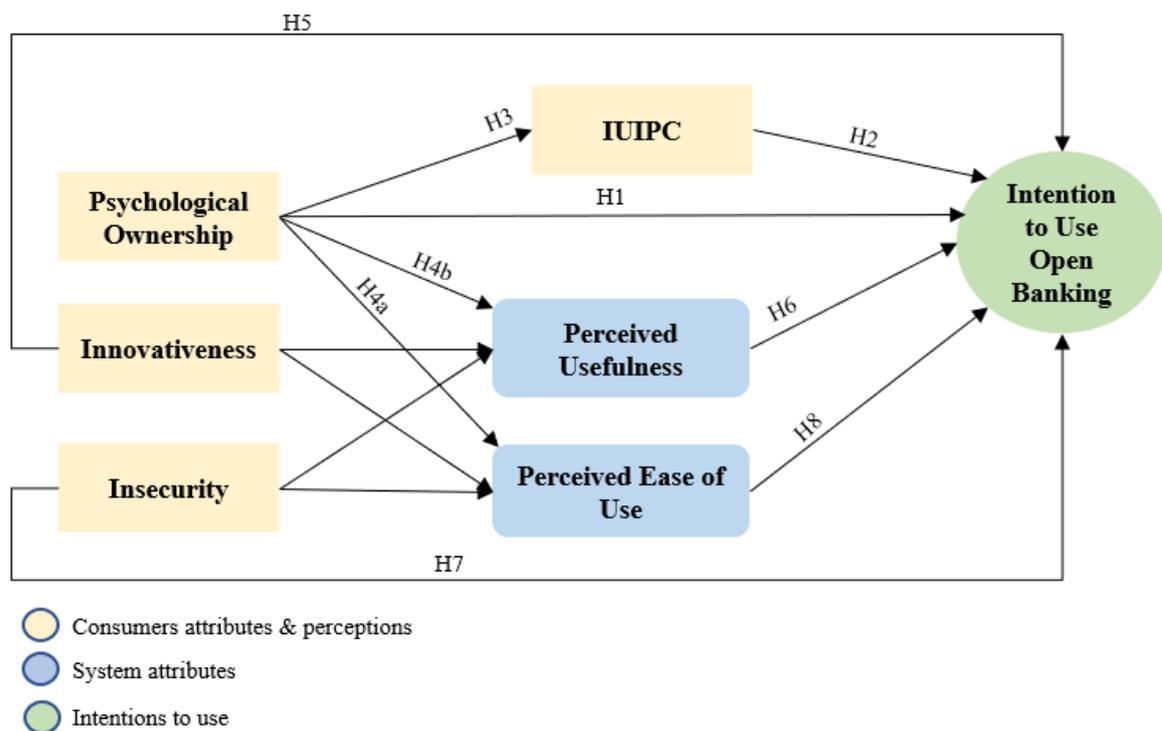
Figure 5 - Conceptual Framework

3.3 Hypotheses

As argued In Chapter 2, the feeling of ownership deeply satisfies human needs and depends on the extent to which an individual feels in control of an object (Pierce et al., 2003). In fact, when individuals notice changes occurring to an object they perceive as theirs, or when they feel loss of control over an object, they may come to feel personal loss, frustration, or even stress (Bartunek, 1993). Indeed individuals with high psychological ownership experience strong emotional attachment and control towards the target (Pierce et al., 2004). Applied to the context of the present study, sharing financial data which is perceived as an "object" owned by the consumer, to make use of open banking services can be associated with a perceived loss of control over the personal data (Culnan & Bies, 2003). Further, when control is not allowed or when the future use of information is not known, individuals resist disclosure (Dinev & Hart, 2004). Thus, consumers with feelings of ownership towards their personal and financial data, will probably resist any disclosure request. Therefore, this study hypothesizes that an individual's high sense of psychological ownership of data results in low intention to share personal data and making use of the open banking products and services:

H1: Psychological ownership of data has a negative influence on intention to use open banking products and services.

The relationship between privacy concerns and the disclosing of personal data has been studied extensively. Benson et al. (2015) stated in their research that individuals with a high feeling of control over personal information, are more careful and concerned about disclosing personal information with companies. In other words, individuals with high privacy concerns will look to minimize their vulnerability by limiting the use of online products where the sharing of personal data is needed (Dinev & Hart, 2004, Armstrong & Culnan, 1999, Malhotra et al., 2004). Privacy has sometimes been interpreted as the right to disclose information about oneself. However, the ability to retain information from being disclosed is a condition of that right. Therefore the following hypothesis is proposed:

H2: Internet Users' Information Privacy Concerns negatively influences the consumer intention to adopt open banking products and services

Feelings of psychological ownership demonstrate high attachments to the personal data and resistance to share such information. Additionally, individuals' information privacy concerns result in opposing the disclosing of information. In fact, The feeling of ownership is associated with enhanced privacy concerns (Culnan & Bies, 2003). Hence, in combination, high psychological ownership of data and information privacy concerns create a sharpened resistance to share financial data to use open banking products and services. It is expected that information privacy concerns will mediate the negative relationship between consumers' psychological ownership of data and their intentions to adopt open banking products and services. Therefore, the study hypothesizes that internet users' information privacy concerns mediates the negative influence of psychological ownership and the consumer's intention to adopt open banking products and services:

H3: Privacy concerns mediate the relationship between psychological ownership of banking and the consumers' intention to adopt open banking products and services.

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Considering the negative impact psychological ownership and privacy concerns will have on the disclosure of personal information, it seems also important to explore the strategies that diminish this negative relation. The concepts of perceived ease of use and perceived usefulness could alleviate the risks and the fears about privacy experienced by the consumers.

Individuals regard an object favorably when they perceive that an object belongs to them (Pierce et al., 2001). Psychological ownership of data and the feeling of control can raise positive perceptions about open banking products and services. Previous research indicated that a sense of ownership can result in the perception that a technology is useful and easy to use (Barki et al., 2008; Sau-Ching Yim et al., 2018). In addition, Beggan (1992) showed in his study that individuals evaluate ideas and objects more positively when they feel a sense of ownership towards it. Thus, when consumers feel they have control over their financial data, they may find it easier to make use of the open banking products and services offered by their banks or any other third party provider. The feeling of ownership and control may also overcome the technical barrier the consumers experience when using the new services.

Indeed, the importance of perceived usefulness makes sense conceptually. Consumers are driven to adopt a new technology primarily because of the services it completes for them, and secondarily for how easy or hard it is to get the technology to execute those services (Davis, 1989). When consumers feel that they own their data, they may think that it is useful to use that data in a way to facilitate their financial activities such as: payments, applying for mortgages, or applying for a credit. Thus, the two following hypotheses are proposed for the effect of psychological ownership on PEOU and the effect on PU:

H4a: Psychological ownership of data positively influences perceived ease of use of open banking products and services.

H4b: Psychological ownership of data positively influences perceived usefulness of open banking products and services.

Innovativeness is generally used to assess the "newness" of a certain innovation (Garcia & Calantone, 2002). Consumers that think optimistically and innovatively about a new technology, have the propensity to show positive attitudes toward the technology. Optimism and innovativeness are both enablers of technology readiness (Godoe & Johansen, 2012). Rogers (2003) stated that people who are characterized as innovators adopt new ideas earlier than others. Venkatesh and Bala (2008) have identified a positive relation between innovativeness and the adoption of new processes. Therefore, innovativeness positively influences the intention to use open banking products and services. In addition, perceived ease of use and usefulness mediates the relationship between innovativeness and the intention to use. Building upon these insights, the two following hypotheses are proposed:

H5: Innovativeness positively influences the intention to use open banking products and services.

H6: Consumers' perception of usefulness and ease of use together mediate the relationship between innovativeness and the intentions to use

Insecurity causes consumers to have negative attitudes towards new technologies. Moreover, feelings of insecurity are associated with feelings of ambiguity and little usage (Godoe & Johansen, 2012). The issue of security is crucial for consumers who are willing to

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adopt new technologies and make use of new products, mainly in the financial services industry. In their research, Godoe & Johansen (2012), demonstrated that despite TRAM suggesting that there is a negative impact of insecurity on PEOU and PU and in turn on the intention to use, recent studies have not been able to prove this and find a correlation.

Building on the insights of TRAM, the present study predicted that insecurity has a negative influence on the intention to use. Additionally, it is predicted that TAM mediates the relationship between insecurity and the intention to use.

H7: Insecurity negatively influences the intention to use open banking products and services.

H8: Consumers' perception of usefulness and ease of use together mediate the relationship between insecurity and the intentions to use.

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4. Methodology

The research methodology is one of the most important parts of every study. The choice of suitable technique for the analysis should be in accordance with the formulated problem. This chapter presents the methodology and the research design used to answer the research questions. Based on the conceptual framework and the literature review a relevant survey was developed. First, the statistical method Structural Equation Modelling is introduced. followed by the research design, participants, and the research procedure are presented. Next, the measures and scales are introduced.

4.1 Ethical Approval

The Human Research and Ethics Committee of TU Delft has officially approved the survey on the 23rd of September 2021.

4.2 Sample & Data Collection

The sample of this study was composed of all bank customers in the Netherlands. The respondents were collected via both personal and professional networks as well through a market research office. In total 641 people have participated in the survey. From the research company, 500 respondents were collected. On the other hand, 141 respondents were collected via personal and professional networks.

The data for this research was collected via an online survey designed on the survey tool Qualtrics. Participants received an URL link that directed them to the landing page of the survey. Collecting data via an online survey offers several advantages such as the full automation of data entry and return. The online survey was distributed by personalized emails or via social media. Participants were contacted before the survey was sent and were also assured that their responses remain confidential. Thereby, their willingness to participate was increased. Incomplete and unengaged responses were filtered out of the data set. The total remaining 601 responses were taken for the analysis. Table 1 shows the demographics of the final used sample N = 601. The sample consisted of 304 (50.5%) male and 294 (49%) respondents. Furthermore, the respondents were slightly higher in the 18-34 years old range which is interesting for this study as they will represent the banking consumers in the coming years.

	Sample	
Demographic characteristics	Freq.	%
Gender		
Male	304	50.5
Female	294	49
Rather not to say	3	0.5
Age		
18-34	193	32.1
35-44	146	24.3
45-64	144	24
+65	118	19.6

Table 1 - Demographic information of survey respondents

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4.3 Research Design

The designed survey employed a closed-ended questionnaire with seven-point Likert scale, all items ranging from strongly disagree to strongly agree. A Likert scale is a psychometric measuring tool that is commonly used in questionnaires, and is the most widely used scale in survey research. A questionnaire is a pre-formulated set of questions useful in descriptive and explanatory research. Questionnaires are less time consuming, however they are attributed with a bigger chance of non-response (Serkan & Bougie, 2016). One of the advantages of a questionnaire is that it can be used in a large geographical area. When formulating a questionnaire it is important three main guidelines (Serkan & Bougie, 2016):

- Principle of wording which entails that the language and the wording of the questions have to be understandable, without bias, and ensure the classification of personal data.
- Principle of measurement which means that the collected data has to be measured accordingly. The validity and the reliability of the data must be taken into consideration.
- Principle of appearance which calls for that the setup of the survey should include an introduction, instructions, a set of questions, and a conclusion. This is important to facilitate and motivate the respondents to answer all the questions fully and truthfully.

All questions were translated from English to Dutch to give the respondent the freedom to choose in which language they want to complete the survey. All of the questions in the survey were obligatory, in order to ensure that all questions were answered and to reduce the amount of missing answers.

4.4 Research Procedure

First, the participants were introduced to the goal of the research and to the concept of open banking. All participants were required to provide informed consent in order to get the permission of using their data for research purposes. The survey was divided into five main parts. First part represented the technology acceptance questions followed by the questions regarding the intention to use open banking products and services. The next part included the psychological ownership questions. Then information privacy concerns questions were displayed. Final part included technology readiness questions concluded by two demographic questions.

The first section provided questions regarding the technology acceptance of open banking products and services. This part is divided into two parts: Perceived Usefulness items and Perceived Ease of Use items. Then the intention to use the block was presented followed by the four psychological ownership items. Subsequently, in the IUIPC section, questions regarding information privacy were asked. Next, the items about insecurity and innovativeness were presented to the respondents. Lastly, in the demographic section, some basic information

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about the respondents were asked such as age and gender. In fact, the target group of the study was Dutch bank customers with preferably good spread on gender and age.

Introduction to Open Banking
Perceived Usefulness
Perceived Ease of Use
Intention to Use
Psychological Ownership
Information Privacy
Innovativeness
Insecurity
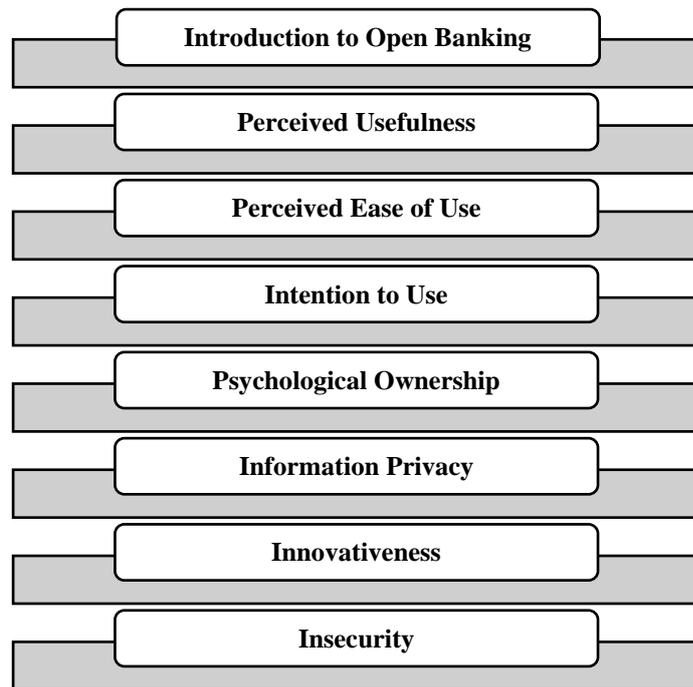
Figure 6 - Structure of the survey

4.5 Measures

This section presents the measurement scales used to measure the different variables of the conceptual framework. The scales for Psychological Ownership, Technology Readiness, Technology Acceptance Model, Internet User's Information Privacy, and Intention to Use are presented. All items were adapted from previous literature in order to ensure content validity. In total the survey consisted of 41 questions.

4.5.1 Independent Variables

The psychological ownership scale – was derived from the scale developed by Van Dyne and Pierce (2004). The authors developed a one-dimensional scale for utilizations in the organizational behavior domain. They developed a seven-item scale to assess the feeling of possession with the organization an individual is connected with. The elements included possessive vocabulary in order to express the attitudes of psychological ownership. The scale covered items of individual and collective psychological ownership. As the collective psychological ownership was beyond the scope of this research, the corresponding collective items will be left out of the survey. Furthermore, the items were modified to make them relevant within the context of the present study. For each item, "the organization", which was the target of ownership in the study of Van Dyne and Pierce (2004), was replaced by "financial data". Examples of psychological ownership items are: 'The bank transactions, payment data, and bank account details are MY financial data' and 'It is hard for me to think about these financial data as MINE'. The items were assessed with a 7-point Likert scale. The rest of the items are listed in the Appendix – A.

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The Internet User's Information Privacy Concerns scale (Malhotra, 2004) – was used for this research to measure the self-reported participant's privacy concerns. The IUIPC construct was a second order construct composed of a ten-scale questionnaire decomposed in three first order dimensions: Control, Collection, and Awareness. All items load on a single, overarching dimension. Similar to the TAM, the items were assessed on a 7-point Likert scale anchored with "strongly disagree" and "strongly agree". Examples of the IUIPC items were: "Consumer control of personal information lies at the heart of consumer privacy" and "It usually bothers me when online companies ask me for personal information". Further, all items are listed in the Appendix – A.

Perceived Usefulness scale was – derived from the TAM model developed by Davis (1989). The scale was composed of 6 items which were modified to fit with the open banking technology. The instrument has good convergent and discriminant properties (Davis, 1989), are internally reliable (Davis et al., 1989), and show predictive validity (Szajna, 1994). The perceived usefulness items were assessed on a 7-point Likert scale anchored with "strongly disagree" and "strongly agree". Examples of perceived usefulness items were: 'Open banking products and services will help me save my time' and 'Open banking products and services will make it easier for me to perform my banking activities'. The rest of the items are listed in the Appendix – A.

Perceived Ease of Use scale – was adapted from Davis (1989) TAM model. Similar to PU, the following scale is composed of 6 items. The items were modified to fit the specific technology (open banking). Likert scales (1-7), associated with anchors ranging from "strongly disagree" to "strongly agree" were used for all the questions. Examples of perceived ease of use items were: 'I would find open banking products and services simple to use' and ' Usage of open banking products and services would be clear and understandable'. The complete items are listed in the Appendix – A.

The Innovativeness scale – was part of the Technology Readiness construct which was developed by Parasuraman (2000). The scale consists of 4 items which were modified to fit the study. The questions were based on a 7-point Likert scale, with 1 being strongly disagreeing with 7 strongly agreeing. Examples of innovativeness items were: 'I keep up with the latest technological developments in my area of interests' and 'People come to me for advice on new technologies'. All items are listed in the Appendix – A

The Insecurity scale – developed by Parasuraman (2000) consists of 4 items such as 'People are too dependent on technology to do things for them' and 'I do not feel confident doing business with a place that can only be reached online'. The items were adjusted to fit the study. Likert scales from 1 to 7 anchored with ''strongly disagree'' and ''strongly agree'' were used to assess the questions. The questions are listed in the Appendix – A.

4.5.2 Dependent Variables

Intention to use scale – was taken from a modified version of the scale developed by (Benbasat & Wang, 2005). The scale was developed to assess the intention to use a technology for conversational agents. It was adapted from the original scale developed by Davis (1989). The three items were assessed on a 7-point Likert scale anchored with "strongly disagree" and "strongly agree". Examples of intention to use items were "I will use open banking products

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and services for my banking activities" and "I will strongly recommend others to use open banking products and services". Further, all items are listed in the Appendix – A.

4.5.3 Translating and Pretesting

Based on literature, the questionnaires for the study were initially developed in English. Afterwards, the questions were translated into the Dutch language. A back-translation technique was used in order to ensure the consistency between English and Dutch.

In addition, pretesting of the questionnaire was performed to ensure the comprehensibility and the effectiveness of every question. Two university professors and two colleagues from PwC helped to test the questionnaires. The term "Open Banking" and "technology" proved to be too broad. Therefore, some questions were adjusted and definitions were added. Also, some minor revisions were made in order to improve the quality of the questionnaire.

4.6 Data Analysis Method

This research applied Structural Equation Modelling (SEM) with SmartPLS software to analyze the influence of the psychological ownership of data of the adoption of open banking products and services. SEM is a particularly popular methodology in quantitative social and behavioral science. SEM allows to include unobservable variables that are measured indirectly by indicator variables and is the most suitable method for analyzing data obtained from surveys (Hair et al., 2011). The technique combines factor analysis and multiple regression analysis in order to evaluate the relationship between the measured variables and the latent variables.

There exist two general approaches to SEM: the covariance-based SEM (CB-SEM), and the partial least square SEM (PLS-SEM). CB-SEM is a factor-based technique, relies on the overall fit of the proposed model by goodness-of-fit tests, and is suitable to confirm or to reject theories. PLS-SEM is one of the multiple linear regression modelling techniques, relies on the maximization of the explained variance of the dependent variables, and is suitable to develop theories in exploratory studies (Astrachan et al., 2014).

This study applies the PLS-SEM to estimate the measurements and the conceptual model. When compared to the CB-SEM, PLS-SEM is clearly favorable. In fact, PLS-SEM does not request any minimal requirements of the restrictive assumptions like measurements scales, sample size, or distributional assumptions imposed by CB-SEM (Astrachan et al., 2014). This study considers PLS-SEM as the method for analyzing data because of the following reasons. First, the research emphasizes on prediction and explaining the variance in key target constructs such as the intention to use open banking products and services (Hair et al., 2012). Second, the conceptual model of the research has a quite high level of complexity through six variables and a total of nine hypotheses. Third, the relationship between psychological ownership of data, information privacy concerns, technology acceptance model, and the intention to adopt open banking products and services is believed to be in an early stage of theory development. Therefore it creates an opportunity where new theories and phenomena can be explored. Finally, using PLS-SEM will allow this study to adopt the advantages of the method in terms of less rigorous requirements of restrictive assumption. Hence, it does not make any assumptions regarding the distribution of the data which allows the analysis of non-normally distributed data.

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4.7 Statistical Tool

JASP was chosen for the general statistical analysis, while SmartPLS 3.0 was used to analyze the structural models. The choice was primarily based on the accessibility as JASP is free software and SmartPLS 3.0 has a 30-day trial for free. Furthermore, Smart PLS 3.0 was also chosen for its graphical user interface.

4.7.1 SmartPLS 3.0

Smart PLS is a valuable method for measuring, developing and validating models. To understand the results presented in the following chapters, it is important to understand the concepts and terminology used in the Smart PLS path modeling. In PLS path modelling statistical analysis, there is an outer and an inner model. The outer model is referred to the measurement model whereas the inner model is referred to the structural model.

The measurement model shows the relationship between each unobserved construct or latent variable and the independent predictors which are the indicators or observed measurement items also called manifest variables (Henseler et al., 2009). There are two types of measurement model: a formative or a reflective model. In the reflective model, the manifest variable reflects the effect of the latent variable. The values that appear on the paths from a latent variable to each of its corresponding manifest variables are referred to as factor loading (Henseler et al., 2009).

On the other hand, in a formative model, the manifest variables cause the latent variables to happen. The relation between the manifest variables and latent variables is causal. In such a model, the values on the paths between each manifest variable to the latent variables reflect the weight of effect and are referred to as the weight coefficient (Henseler et al., 2009).

The nature of the causal relationship between the indicator and the latent variable predicts whether the indicators should be formative or reflective. In the proposed conceptual model, perceived usefulness, perceived ease of use, intention to use, and psychological ownership are reflective constructs. However, the IUIPC construct is a second order reflective-reflective construct. Second order constructs or higher-order constructs are explicit representations of multidimensional constructs that are established at a higher level of abstraction and are related to other constructs, completely mediating the influence from or to their underlying dimensions (Chin, 1998). For the estimation of higher order variables in PLS-SEM, researchers have proposed a two-stage approach (Becker et al., 2012) which is applied in this study. In this method, the first-order constructs scores are estimated in a first stage model without the second-order constructs present. Then, it uses these first-stage construct scores as indicators for the higher order construct variables in a separate analysis (Wetzels et al., 2009). Furthermore, for evaluating higher-order constructs, two additional measurement models need to be considered: the measurement models of the lower-order components, in addition to the measurement model of the higher-order construct as a whole, represented by the relationship between the higher-order component and its lower-order components.

A structural model is the set of directed paths manifesting a causal chain between constructs (Henseler et al., 2009). The relationships between the latent variables are considered formative. Each latent variable that is independent and predicts another latent variable is called an exogenous. Whereas each latent variable that is predicted or dependent by another latent

variable is called endogenous (Henseler et al., 2009). In the inner model, path analysis is used to analyze the model. The values that show on the paths between the latent variables are referred to as path coefficients. A path coefficient is the direct effect of one exogenous variable on another endogenous variable.

To validate a particular model, the process takes place in two different stages separating the measurement and structural models. This is to first ensure the measurement items of every construct are reliable, before trying to make conclusions about the relationship between the constructs.

5. Results

The results chapter presents in detail the results obtained from the analysis of the data. The chapter starts with the descriptive statistics, then it presents the PLS-SEM analysis which includes a two-step process: the assessment of the Measurement and the Structural models. The measurement model determined the reliability and validity of the construct, whereas the construct model verified the significance of the proposed relationships. Below, Figure 7 shows the two-step PLS-SEM approach.

The research is aimed at assessing the inter-relationship of Psychological Ownership, Information Privacy Concerns, Intention to Use, Technology Acceptance, Innovativeness, and Insecurity. A set of hypotheses are proposed in Chapter 3 which will be evaluated in the following chapter.

Outer model assessment
- Examining Individual Item Reliability
- Assessing Internal Item consistency
- Assessing Convergent and Discriminant Validity
- Validating Higher Order Constructs

Inner model assessment
- Assessing The significance of path coefficient
- Assessing The variance of endogenous constructs
- Determining the effect size
- Predictive relevance
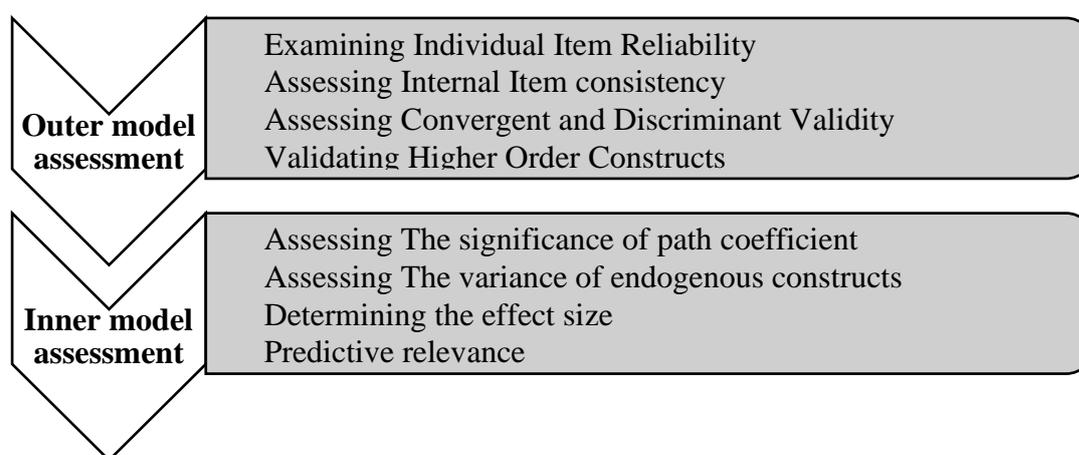
Figure 7 - A two Step Process of PLS Path Model Assessment. Source. (Henseler et al., 2009)

5.2 Descriptive Statistics

Table 2 shows that 48,1% of the respondents were familiar with open banking products and services. From the respondents that were familiar with open banking products and services, 81,3% have ever used an open banking product or service.

Frequencies for Familiarity with Open Banking

	Frequency	Percent	Valid Percent	Cumulative Percent
Not familiar	312	51,9	51.9	51.913
Yes, familiar	289	48,1	48.1	100.000
Total	601	100.000		

Frequencies for Usage of Open Banking product or services

Usage of OB	Frequency	Percent	Valid Percent	Cumulative Percent
No, never	54	18,7	18,7	18.685
Yes	235	81,3	81,3	100.000
Total	289	100.000		

Table 2 - Frequencies of familiarity and usage of open banking products and services

Table 3 shows the descriptive statistics for the variables included in the study. It includes the arithmetic mean, standard deviation, skewness, and kurtosis. Overall, the skewness and kurtosis values of all the variables fell between normal ranges, ±2 for skewness and ±7 for

kurtosis (Kline, 2015; Kim, 2013). Thus, the variables present in this study were normally distributed. The histograms for every variable are shown in the Appendix – B.

Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Psychological Ownership (PO)	601	5.442	1.064	-.408	.100	-.529	.199
IUIPC	601	5.498	.989	-.797	.100	.703	.199
Perceived Usefulness (PU)	601	4.586	1.301	-.592	.100	.344	.199
Perceived Ease of Use (PEOU)	601	4.708	1.252	-.651	.100	.381	.199
Intention to Use (IU)	601	4.299	1.465	-.540	.100	-.266	.199
Innovation (INN)	601	3.843	1.540	-.171	.100	-.748	.199
Insecurity (INS)	601	3.417	1.125	-.283	.100	.562	.199

Table 3 - Descriptive Statistics for Measurement Constructs

Table 4 shows the correlation matrix for all the variables included in the study. Pearson's product correlation of PU and PEOU was found to be highly positive and statistically significant (r=0.779, p<0.001). Additionally, IU was highly correlated with PEOU (r=0.766, p<0.001) and PU (r=0.765, p<0.001). Further, as expected from the literature, PO of data and IUIPC was found to be positively correlated and statistically significant (r=0.605, p<0.001). The results also showed that PO and IU were found to be not significant (p=0.197).

Pearson's Correlations

Variable		PO	IUIPC	PU	PEOU	BI	INO	INS
1. PO	Pearson's r	—						
	p-value	—						
2. IUIPC	Pearson's r	0.598***	—					
	p-value	< .001	—					
3. PU	Pearson's r	0.214***	0.239***	—				
	p-value	< .001	< .001	—				
4. PEOU	Pearson's r	0.249***	0.232***	0.779***	—			
	p-value	< .001	0.232	< .001	—			
5. IU	Pearson's r	0.053	0.232**	0.765***	0.766***	—		
	p-value	0.197	0.232	< .001	< .001	—		
6. INO	Pearson's r	0.069	0.232**	0.381***	0.451***	0.468***	—	
	p-value	0.089	0.232	< .001	< .001	< .001	—	
7. INS	Pearson's r	-0.072	0.232***	0.134***	0.164***	0.157***	0.121**	—
	p-value	0.079	0.232	< .001	< .001	< .001	0.003	—

* p < .05, ** p < .01, *** p < .001

Table 4 - Summary of correlation coefficients

5.3 Measurement model

The measurement model displays the relationship between the constructs and the indicators. The measurement model assessed the quality of the constructs in the study. This is performed by assessing the construct reliability and validity. As mentioned in Chapter 4, the study is following a two-stage approach. The results of the first stage in SmartPLS are presented in the Appendix – C.

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5.3.1 Factor Loadings

Factor loading is defined as "the extent to which each of the items in the correlation matrix correlates with the given principal component. Factor loadings can range from -1.0 to +1.0 with higher absolute values indicating a higher correlation of the item with the underlying factor" (Pett et al., 2003, p. 299). Hair et al. (2006) recommended a factor loading value of greater than 0.5.

INS1 (0.477) and PO4 (0.350) both had a loading below 0.5. PO4 was removed whereas INS1 was kept. Removing the item INS1 negatively affected Cronbach's alpha and the composite reliability of the measure. Thus, it was decided to keep the item for better construct reliability. On the other hand, removing PO4 resulted in a greater Cronbach's alpha and a greater composite reliability. The table "Factor Loadings" in Appendix – D presents the factor loadings of all first order constructs.

5.3.2 Indicator Multicollinearity

Variance Inflation Factor (VIF) statistic is utilized to assess multicollinearity in the indicators (Fornell & Larcker, 1981). Multicollinearity is not an issue if the value of the VIF is below 5 (Hair et al., 2012). The table "Multicollinearity Statistics (VIF) for indicators" in Appendix – D presents the VIF values for the lower order indicators in the study. The VIF for each indicator is below the recommended threshold.

5.3.3 Reliability Analysis

Reliability is defined "as the extent to which a measuring instrument is stable and consistent. The essence of reliability is repeatability. If an instrument is administered over and over again, will it yield the same result" (Mark, 1996, p.285). Cronbach Alpha and Composite Reliability are the two most commonly used methods to assess reliability. The results for Cronbach Alpha for the measurements of this study are presented in Table 5. The value of Cronbach Alpha ranged between .762 and .951 whereas Composite Reliability ranged from .794 to .960. Both indicators are bigger then the required threshold of 0.70 suggested by (Hair et al., 2011). Hence, construct reliability is established.

	Cronbach's Alpha	Composite Reliability
AWRE	0.872	0.921
CLC	0.898	0.928
CNT	0.824	0.895
INN	0.904	0.933
INS	0.762	0.779
IU	0.919	0.949
PEOU	0.946	0.957
PO	0.873	0.922
PU	0.951	0.960

Table 5 - Construct Reliability Analysis

5.3.4 Construct Validity

Construct validity is the degree to which a construct in the study measures the concept it is intended to measure (Bagozzi et al., 1991). It is determined to assess two forms of validity: convergent and discriminant validity.

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5.3.4.1 Convergent Validity

Convergent Validity can be defined as "the degree to which multiple attempts to measure the same concept are in agreement. The idea is that two or more measures of the same thing should covary highly if they are valid measures of the concept" (Bagozzi et al., 1991). This explains that when measures that should be related to each other are in fact related, meaning that the items for a particular construct come together to represent the latent construct.

Convergent validity is established when the items explain 50% or more variance in the latent construct. To establish convergent validity, the Average Variance Extracted (AVE) statistic is calculated based on the factor loadings. A latent unobserved construct having an AVE value of 0.5 or higher, explains the establishment of the construct's convergent validity (Fornell & Larcker, 1981). The AVE statistics for this study showed that all constructs except for INS had an AVE greater than 0.5. INS had an AVE of 0.485. However, the Composite Reliability value for all the constructs was greater than 0.7. Thus, convergent validity for INS was not an issue (Latif et al., 2020). The AVE values are presented in Table 6.

	Average Variance Extracted (AVE)
AWRE	.796
CLC	.765
CNT	.740
INN	.776
INS	.485
IU	.861
PEOU	.789
PO	.797
PU	.802

Table 6 - Construct Convergent Validity (AVE)

5.3.4.2 Discriminant Validity

Discriminant validity assesses the distinctiveness of the different constructs in the carried study. It can be defined as "the degree to which measures of different concepts are distinct. The notion is that if two or more concepts are unique, then valid measures of each should not correlate too highly" (Bagozzi et al., 1991,p.425). Several different methods are available to assess the discriminant validity. In the following study, Fornell & Larcker Criterion is used to check the discriminant validity.

According to Fornell & Larcker (1981), discriminant validity is established when the square root of AVE for a construct is greater than its correlation with all other constructs. The results in Table 7 show that the square root of AVE for each construct is greater than its correlation with other constructs. The bolded values in the table, representing the square roots of the AVEs, are bigger in all cases than the diagonal values in their corresponding rows and columns. This provides evidence of the discriminant validity of the scales (Fornell & Larcker, 1981).

	AWRE	CLC	CNT	INN	INS	IU	PEOU	PO	PU
AWARE	*.892*								
CLC	.659	*.874*							
CNT	.751	.474	*.860*						
INN	.127	.049	.164	*.881*					

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INS	.106	.328	.044	-.140	***.697***				
IU	.149	.019	.168	.466	-.206	***.928***			
PEOU	.289	.065	.290	.457	-.255	.772	***.888***		
PO	.650	.436	.643	.184	.053	.172	.329	***.893***	
PU	.263	.090	.307	.384	-.211	.767	.781	.289	***.896***

Table 7 - Discriminant Validity - Fornell & Larcker Criterion

5.3.4 Validating Higher-Order Constructs

In this study Internet Users' Privacy Concerns was a higher-order construct. IUIPC is based on three lower order constructs: collection, control and awareness. Higher-order constructs are also validated as part of the measurement model assessment. The IUIPC construct was treated as a reflective-reflective high order construct.

The evaluation of a reflective-reflective high order construct was done by assessing the relationship between higher-order and lower-order components as loadings, assessing the convergent validity and reliability, and the discriminant validity (Sarstedt et al., 2019). For IUIPC, the loadings of AWRE, CLC, and CNT were (0.938), (0.767), and (0.886) respectively. Those loadings were particularly high which enabled it to establish indicator reliability. The results for reliability and validity for IUIPC are shown in Table 8. Cronbach's Alpha (0.835) and Composite Reliability (0.9) are both greater than 0.7. Further AVE is greater than 0.50. Thus the reliability and the reliability of IUIPC construct was established.

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
IUIPC	.835	.900	.751

Table 8 - IUIPC Reliability and Convergent Validity

Discriminant validity of the higher-order construct with the lower order construct was also assessed. Table 9 shows the results of Fornell and Larcker criterion. The square-root of AVE of IUIPC is higher than its correlation with all other lower constructs. Therefore the discriminant validity was established.

	INN	INS	IU	IUIPC	PEOU	PO	PU
INN	**0.881**						
INS	0.140	**0.697**					
IU	0.466	0.206	**0.928**				
IUIPC	0.139	-0.156	0.142	**0.867**			
PEOU	0.457	0.255	0.772	0.267	**0.888**		
PO	0.184	-0.052	0.172	0.678	0.329	**0.893**	
PU	0.384	0.211	0.767	0.271	0.781	0.303	**0.896**

Table 9 - Fornell and Larcker Criterion - IUIPC Discriminant Validity

5.4 Structural Model

After evaluating the reliability and validity of the measurement scales, the research hypotheses based on the review of the literature were tested. The structural model evaluated the relationship between the different variables. The relationships between independent variables and dependent variables were tested by means of linear regression.

PLS-SEM does not assume that the data are normally distributed. Consequently, PLS applies nonparametric bootstrapping which includes repeated random sampling with

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replacement from the original sample to create a bootstrap sample, in order to obtain standard errors for hypothesis testing (Hair et al., 2011). The significance of all relationships was examined with bootstrapping procedure, using 5000 iterations and no sign changes. The Bootstrap results are presented in the Appendix – E. Further, the hypotheses were assessed by considering the path coefficient and its significance, the explained variance (R^2) and the predictive relevance (Q^2) (Hair et al., 2011).

5.4.1 The Path Significance

First, the structural model was assessed for the significance of the direct relationships between the independent variables and the dependent variables. This was completed by examining the path coefficient between the constructs. The values of the path coefficients should vary between -1 and +1, indicating a negative or positive relationship between the variables. Further, to test for significance of the paths, a two-tailed test was computed for t-statistics and P-values at a significance level of 5%.

The results of the path coefficients and their significance are shown in Table 10. As displayed in Figure 8, psychological ownership had a significant negative effect on intention to use (β=-0.091, p<0.05). This confirmed the expectations from the literature, therefore H1 was Accepted. Remarkably, IUIPC had not a significant (p=0.152) effect on IU, which was in contradiction to the literature. Therefore, H2 was rejected. Further, psychological ownership had a significant positive effect on perceived ease of use (β=0.275, p<0.05) and perceived usefulness (β=0.259, p<0.05). Therefore hypotheses H4a and H4b could be confirmed. Innovation had a positive effect on the intention to use (β=0.136, p<0.05). Thus, hypotheses H5 was confirmed. However, opposite to the expectations, the study detected an insignificant relationship between insecurity and the intention to use (p=0.395). Hence H7 was rejected. Another finding in the model was the significant positive relationship between psychological ownership and information privacy concerns (β=0.678, p<0.05).

Hypothesis	Relationship	B	STDEV	t Statistics	p values
H1	PO → IU	-.091	.036	2.511	.012
H2	IUIPC→IU	-.048	.033	1.431	.152
H4a	PO → PEOU	.275	.037	7.490	.000
H4b	PO → PU	.259	.037	6.639	.000
H5	INN→IU	.136	.135	4.720	.000
H7	INS→IU	-.022	.026	.850	.395

*Table 10 - Path Coefficients*

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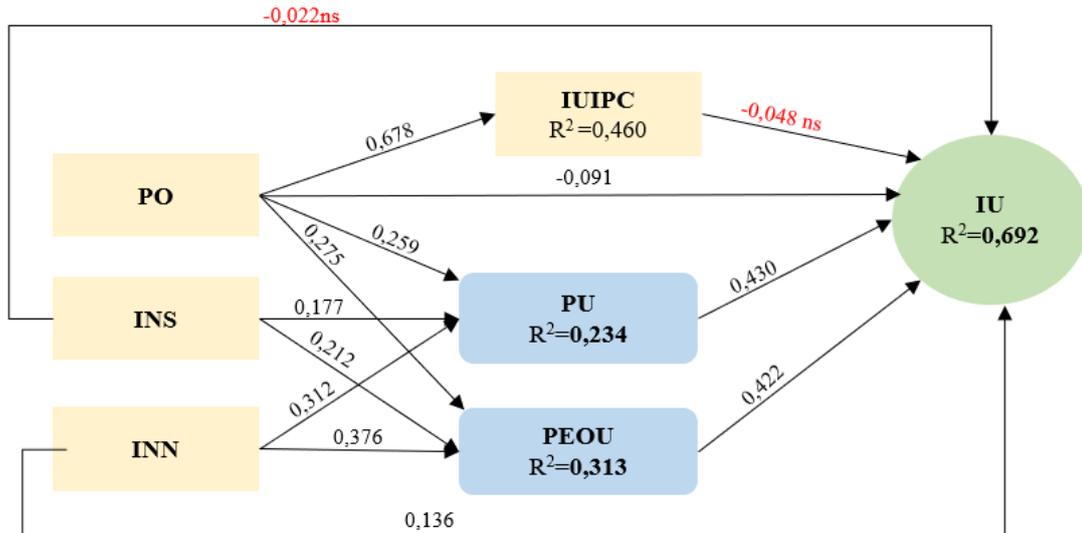
Figure 8 - Conceptual model showing R² and the path coefficients

5.4.2 Mediation Analysis

Mediation analysis was performed to assess the mediation role of IUIPC on the linkage between PO and IU. The mediation analysis was done by computing total indirect effects and specific indirect effects. The results revealed insignificance ($p>0.05$) mediation role of IUIPC on the IU ($p=0.187$). Therefore H3 stating that IUIPC mediates the effect of psychological ownership on the intention to use open banking products and services was neglected.

On the other hand, with the inclusion of the two variables PEOU and PU, the impact of PO on IU became significantly positive ($\beta=0.124$, $p=0.002$). The results of the mediation are shown in Table 13. Since the direct effect is statistically significant, and both effects of PEOU and PU are significant, a partial mediation relationship was established. Based on the framework of (Zhao et al., 2010), the mediation can be interpreted as a competitive mediation.

Total Effect (PO→IU)			Direct Effect		Indirect Effect				CI	
β	t value	p value	β	p values		β	t Value	p values	2.5%	97.5%
.195	5.155	.000	-.091	.012	PO→PU→IU	.111	5.056	.000	.070	.156
					PO→PEOU→IU	.116	5.374	.000	.078	.164

Table 11 - Mediation Analysis PO →IU

Mediation analysis was performed to assess H6: the mediation role of TAM between innovation and the intention to use. The results shown in Table 11 demonstrated a significant mediation role of PU and PEOU on the IU. The indirect effects were significant, likewise the total effect ($p<0.05$). Hence, H6 is confirmed and the mediation is complementary.

Total Effect (INN→IU)			Direct Effect		Indirect Effect				CI	
β	t value	p value	β	p values		β	t Value	p values	2.5%	97.5%
.293	10.599	.000	.136	.000	INN→PU→IU	.134	5.494	.000	.089	.184
					INN→PEOU→IU	.159	6.422	.000	.113	.212

Table 12 - Mediation Analysis INN→ IU

This study further analyzed the mediation role of TAM between insecurity and the intention to use H8. The results shown in Table 12 demonstrated significant total and indirect effects and an insignificant direct effect of insecurity on intention to use. Therefore PU and

PEOU mediate the effect of insecurity on the intention to use. Thus, H8 is accepted. According to Zhao et al. (2010), the model is an indirect-only mediation.

Total Effect (INS→IU)			Direct Effect		Indirect Effect				CI	
β	t value	p value	β	p values		β	t Value	p values	2.5%	97.5%
.166	6.297	.000	-.022	.395	INS→PU→IU	.076	4.048	.000	.045	.118
					INS→PEOU→IU	.089	5.019	.000	.058	.128

Table 13 - Mediation Analysis INS→IU

5.4.3 Model Fit

The model fit was also assessed in this study through standardized root-mean square residual (SRMR). Henseler et al. (2009) referred to the SRMR as an index for model validation. A standardized root-mean square value below 0.08 is favorable (Hu & Bentler, 1999). The model in this study estimated a SRMR value of 0.068, which confirmed the model fit of the PLS model.

5.4.4 The Explained Variance R^2 and The Prediction Relevance Q^2

The explained variance R^2 is the proportion of the variance in each predicted variable that can be explained. A low value of R^2 means that the model is unable to explain the dependent variable which in turn will yield some uncertainties on the theory proposed (Henseler et al., 2009). According to Hair et al. (2011), R^2 values of 0.75 are substantial, 0.5 are moderate, and 0.25 are weak for dependent variables in the structural model.

The Prediction Relevance (Q2) reflects the model's ability to predict the measurement items of the endogenous variables within the model (Henseler et al., 2009). The predictive relevance was measured using blindfolding. The blindfolding technique gives a value which is a criterion that explains how well the model is in predicting missing values in the data set. The blindfolding technique was only applied to variables which have reflective specifications (Hair et al., 2011). A positive Q^2 means that the model has predictive relevance. Likewise when its value is negative, it means that the model lacks predictive relevance. In fact, the higher the Q^2, the better its predictive relevance (Henseler et al., 2009).

The results of R^2 and Q^2 are shown in Table 14. The results showed an R2 value of (0.460) for IUIPC, (0.313) for PEOU, and (0.234) for PU. The amount of variance explained in the predicted variables ranges from a low of approximately 23% to a high of 69%. According to Hair et al. (2011), it can be concluded that the model had a weak to moderate prediction power for the endogenous variables. Further, the results showed all positive ($Q^2>0$) values for the four variables. Thus the model had predictive relevance for these variables.

Further, Looking at the value of R^2 showed that the research model was able to explain 69% of the variance in intention to use. Thus, consumers are generally willing to adopt new open banking products and services. This means that the model has a moderate prediction power for the intention to use open banking products and services

	R2	t Statistics	p Values	Q²
IU	.692	25.752	.000	.578
IUIPC	.460	12.094	.000	.335
PEOU	.313	9.024	.000	.247
PU	.234	6.393	.000	.187

Table 14 - Prediction Power and Predictive Relevance

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6. Discussion

The financial industry is shifting towards an open banking environment. Assessing the consumer's use intention and adoption of the emerging phenomenon are central for its success. In the open banking environment, financial data and its ownership play a big role. In this context, there seems to be no scientific investigation of the psychological ownership of data and its link to the adoption of open banking products and services. Further, there was a noticeable gap in the studies assessing the adoption of new technologies within the banking industry. These studies assessed the intention to use only by focusing on the system's attributes using the TAM model. In this research, external variables attributed to consumer's perceptions were added to the model. The research studied how PO of data influences the IU (Hypothesis 1), how IUIPC influences the IU (Hypothesis 2) and whether it mediates the relationship between PO and IU (Hypothesis 3). Further, it studied how PO affects PU and PEOU (Hypothesis 4a, 4b). In addition, the effect of innovativeness on IU is assessed (Hypothesis 5) and whether this is mediated by TAM (Hypothesis 6). Likewise, the effect of insecurity on the IU (Hypothesis 7) and whether this is mediated by TAM (Hypothesis 8).

With respect to the hypothesis on psychological ownership, the results suggested that consumers with a high level of PO are reluctant to use open banking products and services. A high feeling of psychological ownership towards financial data increases the unwillingness to disclose the data. This confirms the findings of Culnan & Bies (2003) stating that an individual sharing an object regarded as his will be perceived as a loss. This evidence also supports the idea that PO results in strong emotional attachment and control towards the object (Pierce et al. 2004). Further the findings also demonstrated that IUIPC did not influence the IU. Further the non-significance of the mediation effect of IUIPC indicates that the IU was not related to privacy concerns. These findings revealed a contrary position to that postulated in the literature (Dinev & Hart, 2004, Benseon et al., 20215, Malhotra et al., 2004) and seem to indicate that the effect of privacy concerns on the intention to use does not apply in the open banking environment. In fact, Morando et al. (2014) argued that privacy behavior is a highly contextual phenomenon. Consumers will not demonstrate the same privacy concerns in different contexts. This suggestion further highlights that the financial context, and more precisely the banking context, is different to other contexts such as social media or e-commerce. One clear difference is consumers' objectives. When using an open banking product or service, consumers are generally interested in getting benefits out of it, such as better financial advice or saving time and effort. They would not use such a product to obtain satisfaction or pleasure which is the case for social media or e-commerce.

Findings of the research also demonstrated that PO positively influences PU and PEOU. This result supplies additional support for individuals regarding an object favorably and useful when they perceive that object as theirs (Pierce et al., 2001; Barki et al., 2008) but has not been linked to literature on personal or financial data. This suggests that once consumers feel that they have control over their personal and financial data, they perceive the usefulness and the ease of use of open banking products and services better. They may also think that it would be profitable to make use of their proper financial data for more convenient and personalized financial products and services.

Further, the study was unique for its inclusion of PO as an external variable to the TAM model. An explicit attempt was made to merge the literature on technology acceptance and

psychological ownership. The added contribution of PU and PEOU, as mediators variables, was clearly demonstrated. The path from PO to the intention to use was negative, as expected, unless mediated by PU and PEOU. Thus, no matter how attached consumers are to their financial data, they will intend to use open banking products and services if they believe that the products are beneficial to them. Given the novelty of the study, the study did not formally hypothesize these relations. These results provide strong incentive for future research to consider PO as a key variable for the TAM model.

It is also interesting to mention that the findings have important implications for the TRAM literature (Lin et al., 2007). The study has used two-component: Innovation and Insecurity, which are personality traits from the Technology Readiness (TR) model to enhance the applicability and explanatory of the TAM model. The results support the notion that TAM mediates the effect between the TR components and the intention to use (Buyle et al., 2018). Further, the results revealed that innovativeness was an important influencer for the intention to use. On the other hand, the results suggest that "the avoiders", people scoring high on insecurity, do not directly affect the intention to use. This is consistent with other studies that have not been able to demonstrate the negative effect of insecurity on the intention to use (Godoe & Johansen, 2012; Buyle et al., 2018).

6.1 Theoretical Implications

This study contributed to the existing literature concerning technology adoption of IS. It added new external variables to the TAM: psychological ownership and IUIPC. To the author's knowledge, the present study is the first ever known academic attempt to add the construct of psychological ownership to the TAM model. In addition, the study is the first of its kind that theorized about the open banking adoption. Therefore it provides the basis for subsequent research for open banking and consumers.

First, this study adds to the growing literature on psychological ownership (Morewedge et al., 2021). The study confirms the importance of taking into consideration PO of data which affect the adoption of a particular technology or system. In addition, as Acquisti et al. (2013) noted, this study provides evidence that giving more control to the consumers over their data, through policies or through providing "opt-out" options, increases the psychological ownership of data. Further, the study also contributes to the debate of how to attract consumers with high psychological ownership feelings. Previous research has shown that privacy protection are effective strategies to attract consumers with high feelings of ownership of data (Morewedge et al., 2021). However, the findings of this study suggested that showing the PU and PEOU of a new product or a service are effective methods to promote consumers sharing their data. This is a remarkable outcome of this research which is not underlined by other scholars. The effect of PO on the intention to use is mediated by TAM. When assessing the adoption of new technologies where personal or financial data plays an important role, it is important to include the PO as an external variable to the TAM model.

Second, the study has added a more theoretical contribution on the previous studies conducted on the TRAM model (Guhr et al., 2013, Lin et al., 2007). Results have demonstrated that the two technology readiness constructs were positively associated with the TAM constructs. In addition, it has been demonstrated that the TAM model mediates the relationship between TR and the intention to use. In fact, personality traits such as innovativeness and

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insecurity influence the perceived ease of use, the perceived usefulness, and the intention to use. This suggests that in addition to the system characteristics, focusing on consumer's TR is another way to increase consumer adoption of a new technology. As stated by Lin et al. (2007), combining TR and TAM enhances the explanatory of the models in marketing settings. In fact, it implies that marketers can concentrate more on individual characteristics such as focusing on one specific group of users that then expands the technology to other target users. In addition, measures of TR provide valuable information on the way new technology is designed and implemented.

6.2 Practical Implications

This research studied the influence of psychological ownership of data, information privacy concerns, and technology readiness on the consumer adoption of open banking products and services. First of all, the study has proved that the majority of the respondents stated that they were psychologically attached to their personal and financial data. In other words, individuals feel that their financial data is owned by them and not by the financial organizations where it is stored. On the other hand, it also proved that not all of the respondents were aware about the ownership and control of their financial data. Therefore, banks need to raise awareness of "PSD2" and ownership of financial data by providing accurate consent management information so consumers can decide how their data will be collected, used. Giving consumers more control will stimulate psychological ownership (Morewedge et al., 2021). Another way to foster the psychological ownership of data is to shift to experiential consumption of data by giving the consumers more control over its disclosure, display, or delivery (Weiss & Johar, 2016). Further, using decentralized autonomous platforms such as blockchain could also preserve the ownership of data (Morewedge et al., 2021). Thus, an increase in psychological ownership and control of financial data, will result in perceiving open banking as a secure and safe environment (Pierce et al., 2001; Beggan 1992). In turn, this will increase their use of open banking products and services.

The results have demonstrated that usefulness and ease of use overcome the concerns about privacy and insecurity. A number of recommendations can be passed to financial companies interested in getting into the open banking environment. It is evident that the key to the adoption of these products lies in the change of the consumers' perspective regarding the way they do their banking activities, and in convincing them to adjust their banking habits. Therefore it is important that banks focus on informing consumers of the usefulness of these products or services. It is essential that they focus their effort on implementing user experience and go beyond consumers' expectations. Banks should look not only to highlight the utility of open banking, but also the added value to their use. In fact, the results have demonstrated that usefulness and ease of use overcome the concerns about privacy and insecurity. Moreover, PU and PEOU are one of the first factors individuals regard when they adopt a particular system, especially in the context of this study which is a voluntary use (Luarn & Lin, 2004). So, the quality of open banking products and services play an important role in determining individuals' perception of usefulness. If an open banking product or services is not good, this will lead to risks regarding personal and financial information which in turn will not be perceived as useful.

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6.3 Limitations and Future Work

As with all research, the study has some limitations, each of which provides opportunities for further research. First, the research used online questionnaires to measure the variables included in the study. However, such an approach only measures the perception of what individuals think they are, and might not reflect how they behave in reality (Hoskin, 2012). In addition, as with all surveys, this study provided only a snapshot of consumer beliefs and perceptions. In reality, the banking environment is constantly changing as consumers gain experience (Venkatesh & Davis, 1996) which means that there is a constant need for updating the collected information.

Second, given that the study was conducted using a sample from The Netherlands, the outcomes of the study are considered limited geographically. For example, characteristics of psychological ownership are exhibited differently across and within cultures (Morewedge et al., 2021). Comparative studies in other countries with different beliefs regarding privacy concerns, ownership, and different legal structures should be conducted in the future to provide new insights about the adoption of open banking.

Third, the results are derived from one single study. Generalization should not be based on results of singles studies (Driskell & Salas, 1992). The investigation of open banking adoption is new to the literature. Thus continued research is needed to generalize the findings and discussion.

Fourth, it is also worth mentioning that a large number of respondents were not familiar with open banking or have never used such products and services. This might have impacted their overall perceptions and thoughts. However a clear definition of open banking in addition to examples of popular products in The Netherlands were presented at the beginning of the survey. In fact, TAM which is used a lot for IS success, focuses on the behavior intention rather than the actual behavior of the users. The model assumes that the more individuals perceive the technology to be useful, the more likely they will use it.

Based on these limitations, recommendations for future work are presented. Given the novelty of the research objectives, different studies with mixed methods approach are suggested. This will allow using insights from one study to the other one. In doing so, it is recommended to combine qualitative and quantitative research (Venkatesh et al., 2013). Further, given the lack of studies linking psychological ownership of data and the disclosing of the data, a qualitative research would be convenient for its exploratory and broader research approach. An example for such a study is using the theory of consumption values (TCV) which includes five values that influence consumers behavior for adoption of a technology (Hedman & Gimpel, 2010).

Furthermore, given that the constructs of this study only measured the use intention, it is important that future research assesses the actual use of open banking products and services. This could be done by using more than one dependent variable to explain the adoption and use of open banking products. Additional measures can be incorporated such as user satisfaction and benefits. This can also decrease the weakness of using only one variable for system use (Petter et al., 2008). In this respect, the inclusion of other constructs such as system-related experiences would be useful as well.

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7. Conclusion

Open banking is reshaping every aspect of the banking environment, from customer expectations to the understanding of what a bank is. It focuses on how banks share their data and how they permit their consumers to share their data with third party providers. Open banking will create new roles and business models in the banking sector. It was expected that this would foster innovation, promote competition and increase transparency within the financial industry. However, the implementation and the adoption of open banking products and services is still very limited. This research investigated the factors that influence the consumer adoption of open banking products and services. To better understand the reasons behind the adoption, the study combined systems attributes with consumers psychological attributes. The study added external factors: psychological ownership, internet user's information privacy, and technology readiness to the technology acceptance model.

The main research question was: "*To what extent do internet users' privacy concerns and technology acceptance model mediate the relationship between psychological ownership and the adoption of open banking products and services?*". To answer the research question, a conceptual model was created with a set of hypotheses. An online survey was conducted, whereby data has been collected from the respondents. The hypotheses were tested through structural equation modelling on SmartPLS. Table 15 presents the results of testing the hypotheses.

#	Hypotheses	Result
H1	Psychological ownership of data has a negative influence on intention to use open banking products and services.	**Accepted**
H2	Internet Users' Information Privacy Concerns negatively influences the consumer intention to adopt open banking products and services	**Rejected**
H3	Privacy concerns mediate the relationship between psychological ownership of banking and the consumers' intention to adopt open banking products and services	**Rejected**
H4a	Psychological ownership of data positively influences perceived ease of use of open banking products and services.	**Accepted**
H4b	Psychological ownership of data positively influences perceived usefulness of open banking products and services.	**Accepted**
H5	Innovativeness positively influences the intention to use open banking products and services.	**Accepted**
H6	Consumers' perception of usefulness and ease of use together mediate the relationship between innovativeness and the intentions to use	**Accepted**
H7	Insecurity negatively influences the intention to use open banking products and services.	**Rejected**
H8	Consumers' perception of usefulness and ease of use together mediate the relationship between insecurity and the intentions to use.	**Accepted**

Table 15 - Results of the research

The results registered the significant negative effect of psychological ownership of data on the intention to use open banking services. In addition, no significant result was found for the mediation role of privacy concerns and for its effect on the intention to use. Besides, this study demonstrated the positive effect of psychological ownership on the perceived usefulness and ease of use. In addition, it also discovered the mediation role of the technology acceptance

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model between psychological ownership of data and the intention to use open banking products. Thus, the study has shown that usefulness and ease of use are important predictors for the consumer adoption of open banking services. Furthermore, the results also registered the significance mediation role of the technology acceptance model between the technology readiness constructs and the intention to use. This confirms the applicability of the TRAM model and shows that personality traits are also important in predicting the adoption of a new technology.

In conclusion, this study is a pioneering effort in applying the technology acceptance model with external factors to the newly emerging context of open banking. It has demonstrated that psychological ownership of data plays an important role in this new environment. Although it has a negative effect on the intention to use, this effect is pacified by the perception of the usefulness and ease of use of the services. The research also highlighted the need for banks and financial organizations to raise awareness around the ownership and control of the data. Certainly, the study has raised more questions for future work and is an inspiration for future research on exploring the relationship between psychological ownership and the adoption of technology.

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Appendix – A

Construct	Items in English
Perceived Usefulness	**PU1**. Open banking products and services will help me save my time.
	PU2. Using open banking products and services would improve my performance when conducting banking activities.
	PU3. Using open banking products and services will help in faster banking activities.
	PU4. Using open banking products and services will enhance my effectiveness in bank activities.
	PU5. Open banking products and services will make it easier for me to perform my banking activities.
	PU6. I would find open banking products and services useful in conducting overall banking activities.
Innovativeness	**INO 1**. People come to me for advice on new technologies.
	INO 2. In general, I am among the first in my circle of friends to acquire new technologies when it appears.
	INO 3. I can usually figure out new high-tech products and services without help from others.
	INO 4. I keep up with the latest technological developments in my areas of interest.
Insecurity	**INS 1**. People are too dependent on technology to do things for them.
	INS 2. Too much technology distracts people to a point that is harmful.
	INS 3. Technology lowers the quality of relationships by reducing personal interaction.
	INS 4. I do not feel confident doing business with a place that can only be reached online.
Perceived Ease of Use	**PEOU 1**. Learning to operate and use open banking products and services would be easy for me.
	PEOU 2. I would find it easy to get the open banking products and services technology to do what I want it to do.
	PEOU 3. I would find open banking products and services flexible to interact with.
	PEOU 4. Usage of the open banking products and services would be clear and understandable.
	PEOU 5. It would be easy for me to become skillful at using open banking products and services.
	PEOU 6. I would find open banking products and services simple to use.
Internet User's Information Privacy Concerns	**CTL 1**. Consumer online privacy is really a matter of consumers' right to exercise control and autonomy over decisions about how their information is collected, used, and shared.
	CTL 2. Consumer control of personal information lies at the heart of consumer privacy.
	CTL 3. I believe that online privacy is invaded when control is lost or unwillingly reduced as a result of a marketing transaction.
	AWRE 1. Companies seeking information online should disclose the way the data are collected, processed, and used.
	AWRE 2. A good consumer online privacy policy should have a clear and conspicuous disclosure.

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	AWRE 3. It is very important to me that I am aware and knowledgeable about how my personal information will be used.
	CLC 1. It usually bothers me when online companies ask me for personal information
	CLC 2. When online companies ask me for personal information, I sometimes think twice before providing it.
	CLC 3. It bothers me to give personal information to so many online companies.
	CLC 4. I'm concerned that online companies are collecting too much personal information about me.
Psychological Ownership	PO 1. The bank transactions, payment data, and bank account details are MY financial data
	PO 2. I feel a very high degree of personal ownership for the financial data
	PO 3. I sense that are my financial data
	PO 4. It is hard for me to think about this financial data as MINE (reversed)
Intention To Use	BI 1. I will use open banking products and services for my banking activities
	BI 2. If I have to do banking activities, I would use open banking products and services in the future.
	BI 3. I will strongly recommend others to use open banking products and services

| Construct	Items in Dutch
Perceived Usefulness	**PU1**. Het gebruik van open banking producten en diensten zal me helpen tijd te besparen
	PU2. Het gebruik van open banking producten en diensten zou mijn efficientie bij het uitvoeren van bankactiviteiten verbeteren
	PU3. Het gebruik van open banking producten en diensten zal bijdragen tot snellere bankactiviteiten.
	PU4. Het gebruik van open banking producten en diensten zal mijn doeltreffendheid bij bankactiviteiten vergroten.
	PU5. Het gebruik van open banking producten en -diensten zal het voor mij makkelijker maken om mijn bankactiviteiten uit te voeren.
	PU6. Ik zal open bankieren nuttig vinden bij het uitvoeren van algemene bankactiviteiten
Innovativeness	**INO 1.** Mensen komen naar mij voor advies over nieuwe technologieën.
	INO 2. Over het algemeen ben ik een van de eersten in mijn vriendenkring om nieuwe technologieën aan te schaffen wanneer die opduiken.
	INO 3. Ik kan meestal nieuwe high-tech producten en diensten begrijpen zonder hulp van anderen
	INO 4. Ik blijf altijd op de hoogte van de laatste technologische ontwikkelingen die mij interesseren
Insecurity	**INS 1.** Mensen zijn te afhankelijk van technologie om dingen voor hen te doen.

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	INS 2. Te veel technologie leidt mensen af tot een punt dat schadelijk is. **INS 3.** Open banking technologie verlaagt de kwaliteit van de relaties door de persoonlijke interactie te verminderen **INS 4.** Ik heb er geen vertrouwen in zaken te doen met een bedrijf dat alleen online bereikbaar is.
Perceived Ease of Use	**PEOU 1**. Ik verwacht dat het leren omgaan met producten en diensten van open banking heel makkelijk zal zijn. **PEOU 2**. Ik zal het makkelijk vinden om open banking producten te laten doen wat ik wil. **PEOU 3**. Ik zal open banking producten en diensten handig vinden om mee te werken **PEOU 4**. Mijn interactie met open banking producten en diensten zal duidelijk en handig verlopen. **PEOU 5**. Het zal voor mij makkelijk zijn om soepel te worden met producten en diensten van open banking. **PEOU 6.** Ik zal open banking producten en diensten makkelijk bruikbaar vinden.
Internet User's Information Privacy Concerns	**CTL 1**. Online privacy van de consument is in feite een kwestie van het recht van de consument om controle en autonomie uit te oefenen over beslissingen over de manier waarop zijn informatie wordt verzameld, gebruikt en gedeeld. **CTL 2.** De controle van de consument over persoonlijke informatie vormt de kern van de privacy van de consument **CTL 3**. Ik ben van mening dat de online privacy wordt geschonden wanneer de controle verloren gaat of ongewild wordt verminderd als gevolg van een marketingtransactie. **AWRE 1**. Bedrijven die online informatie zoeken, moeten bekendmaken hoe de gegevens worden verzameld, verwerkt en gebruikt. **AWRE 2**. Een goed online privacybeleid van de consument moet een duidelijke en opvallende openbaarmaking bevatten. **AWRE 3**. Het is voor mij zeer belangrijk dat ik weet hoe mijn persoonlijke informatie zal worden gebruikt. **CLC 1**. Het stoort me meestal wanneer online bedrijven me om persoonlijke informatie vragen **CLC 2.** Wanneer online bedrijven mij om persoonlijke informatie vragen, denk ik soms wel twee keer na voordat ik die geef. **CLC 3**. Het stoort me om persoonlijke informatie te geven aan zo veel online bedrijven. **CLC 4**. Ik maak me zorgen dat onlinebedrijven te veel persoonlijke informatie over mij verzamelen.
Psychological Ownership	**PO 1**. Banktransacties, betaling geschiedenis, en bankrekeninggegevens zijn MIJN financiële gegevens **PO 2**. Ik voel me in zeer hoge mate persoonlijk verantwoordelijk voor mijn financiële gegevens **PO 3**. Ik voel dat mijn banktransacties, betaling geschiedenis, en bankrekeninggegevens mijn financiële gegevens zijn

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	PO 4. Het is moeilijk voor mij om banktransacties, betaling geschiedenis, en bankrekeninggegevens als de MIJNE te beschouwen
Intention To Use	**BI 1**. Ik zal gebruikmaken van open banking producten en diensten wanneer ik mijn bankactiviteiten verricht **BI 2**. Als ik bankactiviteiten moet uitvoeren, zal ik in de toekomst gebruik maken van open banking producten en -diensten. **BI 3.** Ik zal anderen aanbevelen gebruik te maken van open banking producten en diensten

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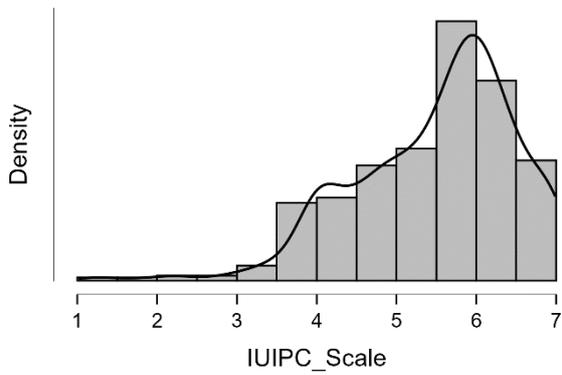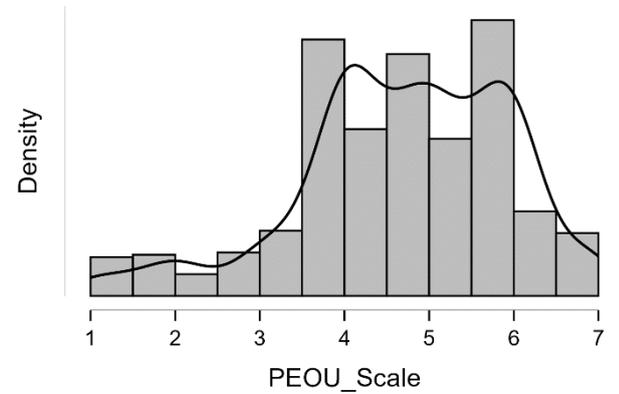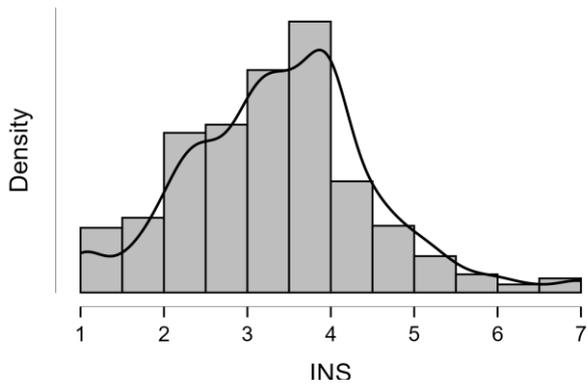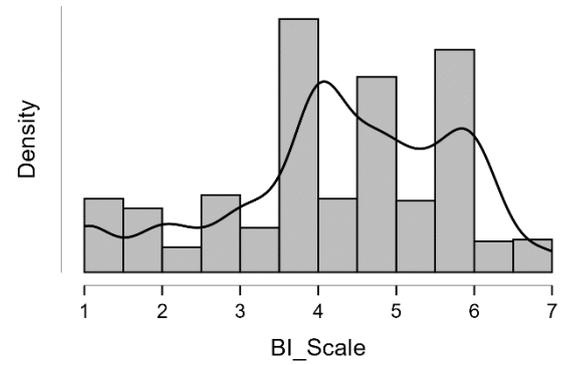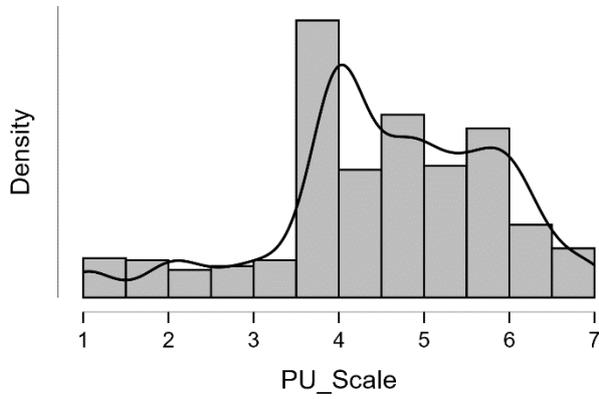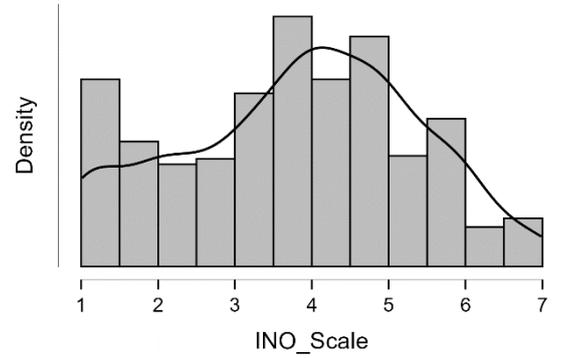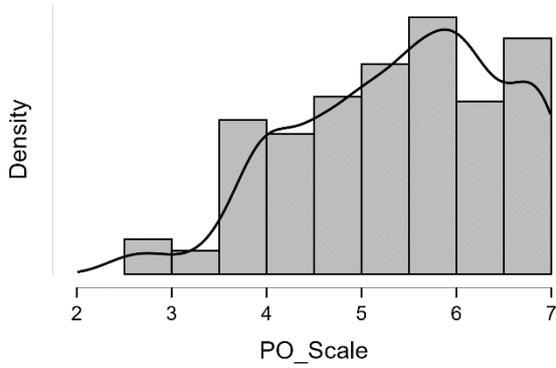
Appendix – B

Appendix – C
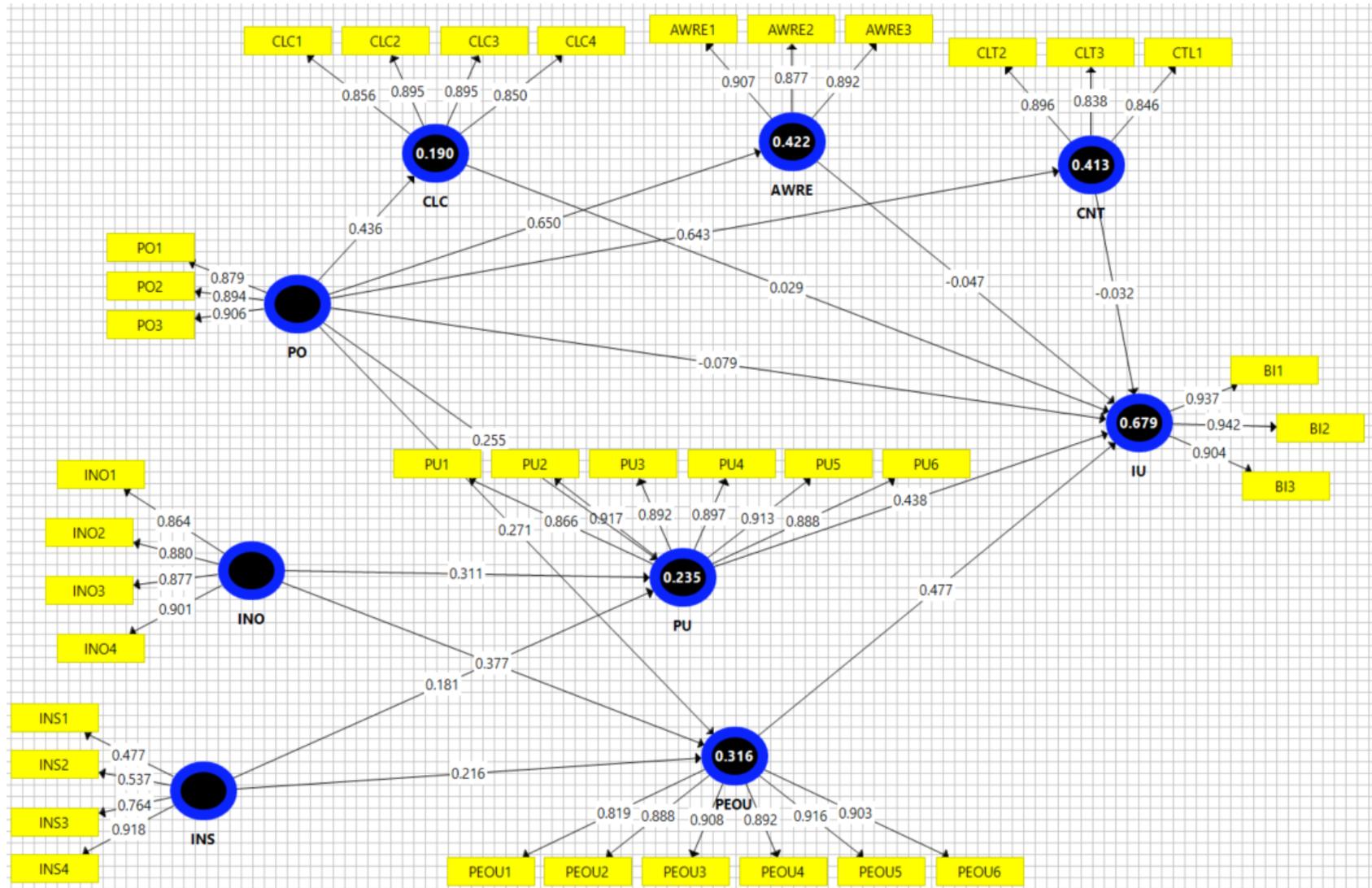
Appendix – D

	AWRE	CLC	CNT	INN	INS	IU	PEOU	PO	PU
AWRE1	.908								
AWRE2	.877								
AWRE3	.891								
CLC1		.856							
CLC2		.896							
CLC3		.896							
CLC4		.849							
CNT1			.847						
CNT2			.895						
CNT3			.838						
INO1				.864					
INO2				.880					
INO3				.877					
INO4				.901					
INS1					**.477**				
INS2					.537				
INS3					.764				
INS4					.918				
IU1						.937			
IU2						.942			
IU3						.904			
PEOU1							.819		
PEOU2							.888		
PEOU3							.908		
PEOU4							.892		
PEOU5							.916		
PEOU6							.903		
PO1								.880	
PO2								.892	
PO3								.907	
PU1									.866
PU2									.917
PU3									.892
PU4									.897
PU5									.913
PU6									.888

Table 16 - Factor Loadings

	VIF
AWRE1	2.523
AWRE2	2.191
AWRE3	2.300
CLC1	2.354
CLC2	2.615
CLC3	2.926

CLC4	2.250
CNT1	1.851
CNT2	2.192
CNT3	1.737
IU1	3.775
IU2	4.012
IU3	2.762
INO1	2.917
INO2	3.249
INO3	2.697
INO4	3.120
INS1	1.721
INS2	1.746
INS3	1.528
INS4	1.318
PEOU1	2.404
PEOU2	3.414
PEOU3	3.928
PEOU4	3.562
PEOU5	4.339
PEOU6	3.762
PO1	2.104
PO2	2.413
PO3	2.673
PU1	3.314
PU2	4.616
PU3	3.591
PU4	3.751
PU5	4.469
PU6	3.573

Table 17 - Multicollinearity Statistics (VIF) for indicators

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Appendix – E