

Final Dissertation

*“The revised Payment Services Directive (PSD2):
Implementation of PSD2 on Spanish bank market”*



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Abbreviations

AIS: Account Information Service

AISP: Account Information Service Provider

API: Application Programming Interface

ASPSP: Account-servicing Payment Service Provider

B2C: Business-to-Consumer

CSC: Common and Secure Communication

EMI: Electronic Money Institution

ERPBB: Euro Retail Payments Board

PIS: Payment Initiation Service

PISP: Payment Initiation Service Provider

PSD1: Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market, amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC

PSD2: Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EPSP: Payment Service Provider

RTS: Regulatory Technical Standards

SCA: Strong Customer Authentication

TPP: Third-Party Provider

TRA: Transaction Risk Analysis

1. Declarations

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

Signature: Lucas Rivilla

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3. Abstract

The revised payment services directive (PSD2), has changed how the retail banking market works today. The new directive obligates banks, with the consumer's consent, to provide access to account information and thus open up the market for new actors. This study aims to provide an understanding of the effect PSD2 have on the retail banking market in Spain and how the players are acting to cope with the changes it entails. To gain in-depth knowledge about the Spanish payment market, four semi-structured interviews have been conducted with subject matter experts. The empirical results of this research conclude that a collaborative relationship between banks and TPPs will facilitate the successful implementation of PSD2 in Spain. Furthermore, the effective use of bank's customer data has become the key competitive advantage for the future thanks to Open Banking. Lastly, the entrance of BigTech's into the payments market threatens the banks' positions.

4. Introduction

4.1. The Research Context

The official entry of the Euro in 2002 made cash payments easier and more convenient in any member country of the European Union (EU). Whenever you travel abroad, the cumbersome and expensive currency exchange was replaced by easy and convenient cash payments in Euros in each EU member state. In this way, cash payments were solved, however, the burden remained for electronic payments. At that time, it was rarely possible to pay the bill in an Italian restaurant with, for example, a debit card belonging to a Spanish bank. Transferring money between accounts in different countries was a slow, expensive, and often problematic task.

To solve these problems and further harmonize the retail payment landscape within its borders, the EU adopted the Payment Services Directive (PSD) in 2007 through the European Parliament and Council. The directive, which became law in 2009, ensured that the same rules apply to electronic payments in each EU Member State. Thus, it facilitated the use of a bank debit card issued in one EU member state (such as Spain) to purchase goods in another member state (such as France).

The PSD1 has been crucial in the creation of a single market for payments in the EU, introducing the concepts of fair and free access to payment markets and increased consumer protection. This directive was the keystone for the introduction and effective implementation of the Single Euro Payment Area (SEPA) which enabled millions of European citizens, businesses, and public authorities to experience electronic payments or money transfers across Europe as easily and safely as in-branch transactions or cash payments.

However, with the development of the digitalization of the financial sector, new kinds of businesses emerged that fell outside the scope of regulation. The banking sector has undergone a fundamental change in recent years in the way new financial services are created and offered to customers. The field of financial services has opened up to new entrants and new services to boost competition. This new scenario anticipates a change in the banking status quo and in banks' current business models, promising the development of new value propositions that will be to the benefit of bank customers and society as a whole. Like other markets worldwide, the European banking sector is adapting to innovation, thanks in large part to the introduction of the new Payment Services Directive (PSD2) which is facilitating this change.

The updated Payment Services Directive (PSD2) was adopted in April 2016 and Member States started to transpose it into their legislation in January 2018. The development of the integrated internal market for secure and easy electronic payments would not be understandable today without this new directive, as it is vital for the growth of the EU economy, promoting innovation, competition and efficiency within the EU.

4.2. The rationale for the Proposed Research

The PSD2 regulation has become a burning hot topic within the financial sector; this review of the PSD1 aims to deepen and update the objectives that the previous directive had not managed to regulate. It brings changes that mainly aim to improve consumer protection, boost competition and innovation in the sector, and strengthen security in the payments market, which expects to favor the emergence of new payment methods and e-commerce. Nowadays, the effects of PSD2 and open banking are widely discussed in the financial sector. Financial institutions and different interest groups within the industry agree that ongoing innovative trends will have a massive impact on the industry. Some experts expose that this could be the most significant disruption in banking for decades. Others say it will create opportunities for banks to develop the new offering and reach new revenue streaming.

The dissertation is motivated by the current importance and novelty of PSD2, as well as by the delay in the implementation of the directive in Spain. It is essential to study the impact that the new directive will have on the Spanish financial market since the arrival of Open Banking is considered the near future in the banking sector. It is also fundamental to find out the reasons for the moratorium requested by the Central Bank of Spain to the European Banking Authority to delay the implementation of the new online payment directive.

The idea of this research project is to study the impact on the role of each player involved in the payments process, to analyze the relationship between them, and to observe the main actions taken by each of them. The principal actors to be examined are the traditional banks, the new Fintech companies acting as Third-Party Payment Service Providers (TPP), and the individual customers. In the conclusion of the project, it seeks to offer a reliable view of the current situation in the Spanish payments market one year after the implementation date of the PSD2 and to check whether the moratorium for the new online payment regulations needs to be extended further.

The objective is to detect the current strengths and weaknesses of each one of them related to the PSD2. The main goal is to identify whether the application of PSD2 fulfilled its purpose and if it has been able to offer all the benefits expected from it.

Thus, the intention is to act as an external consultant so the research project can be used by each player to obtain maximum benefit from it. For example, the banks will be able to use their strengths and the weaknesses of Fintech's competitors presented in this report to maintain or even increase their leading position in the banking sector. Finally, clients themselves will also be able to benefit from the project, as it will help them to understand the advantages and implications of PSD2 that affect them and from which they can benefit in their daily lives.

Therefore, an article published by the Spanish Central Bank, the primary national regulatory authority for the PSD2 in Spain, has been discussed. The research project mainly analyzed in this dissertation is part of the 35th edition of the Financial Stability Journal (November 2018), issued every semester by the Spanish Central Bank to serve as a platform for communication and dialogue on any aspect related to financial stability, with particular focus on prudential

regulation and supervision issues. It is an open publication, which includes personal contributions from researchers and professionals from the financial sector. In this case, the title is “A new regime for Access to Payment Accounts: PSD2” and the authors are Carlos Conesa and Sergio Gorjón, members of the Deputy Directorate General for Financial Innovation and Market Infrastructures; and Gregorio Rubio, member of the Directorate General for Operations, Markets and Payment Systems, all members of the Spanish Central Bank.

Even though the authors emphasize that the research article is solely and exclusively the responsibility of the authors and that it does not necessarily reflect the opinion of the Spanish Central Bank, it can offer a view and advice quite close to that of the PSD2 regulator in Spain.

The other two studies conducted on the impact and implications of PSD2 on the Norwegian and Swedish banking system have been used as a guide of how two of the most advanced countries in Open Banking has implemented and developed the PSD2. The research on the Norwegian banking system is called “The revised Payment Services Directive (PSD2). Implications of PSD2 on Norwegian Banks” (2018) produced by Ida Marie Moen and Helen Hompland Heldgoy students from the Norwegian School of Economics. The paper on the Swedish banking system is entitled “Innovations in Finance as Regulators Push Open Banking. Understanding innovative processes and market change in the Swedish banking market as of PSD2” (2019) produced by Jakob Larsson and Daniel Frandberg students from the Chalmers University of Economics.

The research gaps addressed in this document are the lack of literature dealing with the implementation, development, and outcome during the first months of the life of the PSD2 in the Spanish banking sector. Furthermore, there are few papers on the moratorium approved in September 2019 by the European Banking Authority (EBA) to delay the mandatory application of the PSD2. The value of this research is heavily rooted in the fact that it can provide perspective to banks, Fintechs and other industries stakeholders on a phenomenon that is affecting the development of the future financial markets and creating uncertainty in the market participants.

4.3. Aims for the Proposed Research

The purpose of this dissertation is to study the implementation of the new revised Payment Service Directive (PSD2) on the Spanish Bank Market. PSD2 was supposed to come into full force on 14 September 2019 in Spain. However, the Spanish Central Bank has extended the deadline until the end of the 2020 (31 December 2020) as many of the actors weren't prepared for all the changes they should have carried out. While some traditional banks fear the change, others are just waiting to seize the opportunities this regulation enables. This paper will analyze the strategic options that established players can consider in order to maintain their competitive position. Besides, it will be explored and identified the relevant competitive strengths and weaknesses of the traditional banks concerning such changes.

This research project wants to shed light on this highly relevant topic and apply it to the Spanish Financial Market, which few have deep-dived into previous research. The research brings insight into how the Spanish banking and the payment market is changing with the implementation of the PSD2.

Another objective of the work is to examine the types of financial services that will be opened up through the liberalization of customer data to third parties (TPP), and to study the dynamics of PSD2 development and the new way of the relationship between new Fintechs and traditional banks via APIs in a changing financial market environment. Furthermore, we want to understand the power of data and the consequences of this data liberalization, what these new FinTech's companies will be able to do with the customer data. Although this is an emerging issue, we believe it is particularly relevant given the focus and appeal that liberalization and data usage is having at all levels of society, and especially in a highly regulated sector such as banking.

The research project does not attempt to dismantle or contradict any study previously carried out. The aim of this dissertation is to complete the theoretical work carried out so far. Many experts and businessmen have ventured to write about the PSD2, describing the way in which it was going to operate in Spain, exposing the whole series of advantages that this directive would offer. However, after almost a year since its supposed entry into force, very few papers have been written on the implementation, development and results of the PSD2 in the Spanish banking sector. Here we find the existing Gap, the lack of information and feedback from the main actors in the digital payment process about the first year of life of the PSD2. This paper aims to study and analyze the implementation of the PSD2 directive and its implications on the different players such as traditional banks, new payment services providers and customers.

The dissertation does not seek to deepen the regulatory characteristics, nor the prudential requirements, nor the applicable operational framework explained in full detail in the article of the Spanish Central Bank mentioned in the previous section. The project is focused on the second part of the article, where it evaluates the new challenges and implications provided to the Spanish financial sector with the implementation of the PSD2. The aim is to complete the article written prior to the PSD2, contributing with experiences and visions of experts and people with experience in the banking sector and working with online payment services. As digitalization is a very dynamic subject, this paper offers a vision of payment services as much up-to-date as possible after one year of its implementation and with half a year left until the end of the extension period to implement the PSD2 in Spain (December 2020).

Finally, the impact that this new payment service regulation is having on the user will be measured. The role that the customer will play in this whole process will be studied, what benefits this new directive brings and what new services customers will have access to.

- **Research Question**

- *Has the new Payment Service Directive (PSD2) been successfully implemented in the Spanish banking market?*

- **Research Sub-questions**

- *What are the implications of the PSD2 on Spanish financial market players?*
- *How is the new relationship between the Banks and Third-Party Providers that arise with the Open Banking?*
- *How important has the data become with the emergence of Open Banking?*
- *What impact has this PSD2 had on the users/clients?*

5. Literature Review

5.1. Literature Introduction

The literature review is divided into six main sections. The first section focuses on the implementation process and the new services offered by the revised Payment Service Directive (PSD2). The second section analyses the impact that this new directive has had on Spanish traditional banks. The third section presents how the fintech phenomenon has adapted to PSD2. The fourth section analyses the relationship between the banks and the Fintech. The fifth section explains the new way of doing banking, “the Open Banking”, which has been created as a result of the liberalization of customer data. The last section deals with the new key role of customers and the complete lack of awareness of the new payment services directive.

5.2. The PSD2 implementation

The Second Payment Services Directive [Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market], known as “PSD2” is a European law which was planned to come into full force on 14 September 2019. This revised directive has carried out a comprehensive review of the main regulatory standard for payment services in Europe (PSD1), a process which introduces new challenges for its players and is helping to standardise the structure of the market. The PSD2 is an ambitious and complex piece of legislation that aims to further accelerate the achievement of an integrated, competitive, innovative and efficient market for payment services in the EU, without undermining user safeguards. Hence the importance the Directive attaches to aspects relating to the security of payment services and, in particular, to regulating the activities of new entrants that bank customers may authorise to access their payment accounts at a different financial institution.

The PSD2 is considered one of the biggest changes for commercial banking in history, representing a drastic change in the plans and strategies of traditional banks and players. This new directive will make the sector more dynamic, democratize it by allowing the entry of new players to ensure greater competitiveness (lower cost for the user) and, last but not least, one of the main aspects: it will force banks to open their systems to third parties; to share information. All this, always, guaranteeing to the maximum the security of the client in all the process. And finally, integrated, so that the user can use it anywhere in the EU. (José Luis Nevado, CEO and founder of Sipay Plus)

The launch of the PSD2 directive presents two major changes: a) an extension of its scope to cover new payment services and, b) greater attention to the risks associated with the new strategies arising from the digital transformation.

- **New Payment services of PSD2**

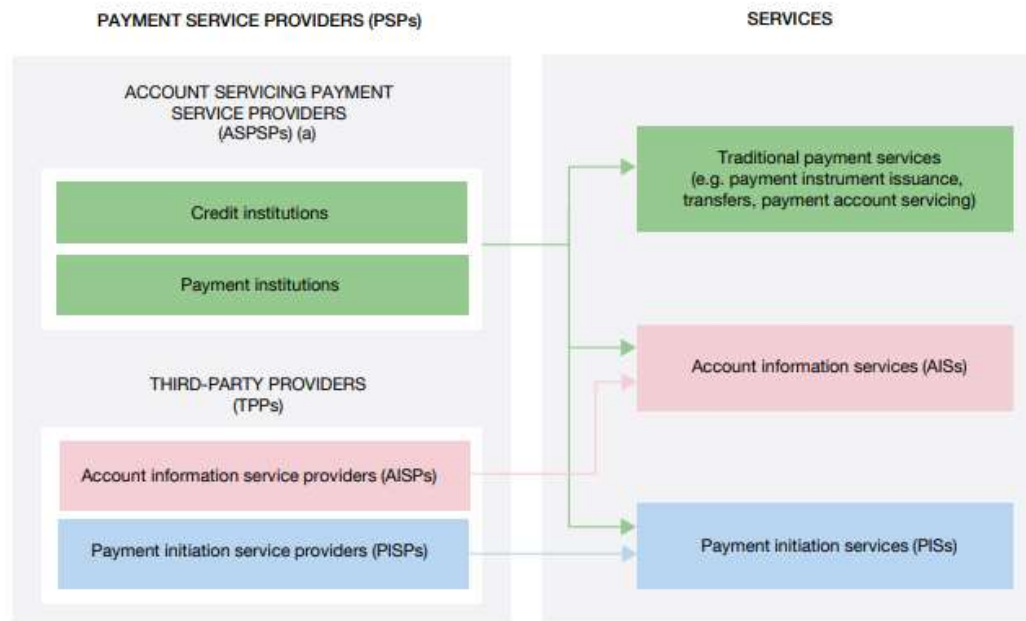
The PSD1 regulated payment services in detail and authorised such services only for credit and payment institutions. These authorised entities subject to supervision are generally referred to as payment service providers (PSPs). However, the services provided by some specialist institutions to the holders of accounts at other institutions remained outside the scope of the PSD1 and, therefore, these were provided within the EU without being specifically regulated.

The main services of this type are the initiation of a payment in an account of another institution (known as a payment initiation service or PIS) and the offering of consolidated information on the outstanding balances and transactions on more than one payment account at different institutions (known as an account information service or AIS). The fundamental characteristic of these services is that the provider does not need to service a payment account; rather, it needs the customer's consent to operate or obtain information on accounts held at other institutions. Firms that have specialised in these types of services are "third-party firms" in the traditional bilateral relationship between the PSP and its customer; accordingly, they are usually called third-party providers (TPPs).

The PSD2 is a response to the regulator's aim of allowing these payment initiation and account information services (PISs and AISs) to be developed and consolidated, in a setting that provides consumers with adequate protection both for their payments and for the information associated with their accounts. Additionally, the PSD2 entitles any holder of a payment account that is accessible online to initiate a payment order and to gain access to the information contained in the accounts through a PSP other than the one at which the account is open. In other words, AISs and PISs are included within the regulatory perimeter, with the appropriate safeguards, to provide consumers with adequate protection.

The PSD2 allows for the existence of PSPs that only provide PISs or AISs, without directly servicing payment accounts. Accordingly, the set of entities that are recognised as PSPs has been expanded, resulting in a complex landscape (see Scheme 1). PSPs are divided into two basic groups: those which service their customers' payment accounts, commonly known as "account servicing payment service providers" (ASPSPs), and TPPs which provide AISs or PISs, without servicing customer accounts. The first group basically includes credit institutions and payment institutions, while in the second group, a distinction is usually drawn between payment initiation service providers (PISPs) and account information service providers (AISP). It is important to note, however, that ASPSPs may provide all manner of payment services, including PISs and AISs, and that TPPs may provide both payment initiation services and account information services, provided they comply with the applicable regulatory requirements (see Scheme 1).

Scheme 1: Payment Institutions and Services



SOURCES: European Payments Council and Banco de España.

- **Security Methods for Electronic Payment Transactions**

The PSD2 focuses particularly on transactions over the Internet or via mobile devices as a result of the significant increase in remote transactions, driven in recent years by the boom in e-commerce. The PSD2 has made the security of electronic payments one of its cornerstones, taking new measures and implementing new procedures that are articulated around the concept of “strong customer authentication” (SCA). This involves the use of two authentication factors in banking operations that previously did not require it, including payments and access to accounts online or through apps, as well as a stricter definition of what can serve as an authentication factor.

However, it was not possible to give a detailed definition of strong customer authentication in the Directive, owing to the technical complexity of this concept. Consequently, the PSD2 confined itself to laying down a series of general principles, and entrusted development of the detailed legal framework that should govern the security of electronic payments to the EBA, in collaboration with the ECB. To this end, the EBA began work on drafting Regulatory Technical Standards (RTS) on strong customer authentication and common and secure communication. These RTS include the main features of strong authentication, seeking to be neutral from a technological standpoint and respecting the different business models. They also include certain exceptions, depending on the risk of the transaction, its amount, and the channel through which it is conducted (see Appendix 1).

5.3. Impact on traditional Banks

The PSD2 has forced traditional banks out of their comfort zone, mainly due to the opening up of their platforms and the liberalisation of their client data to third parties (direct competitors, rival banks, and start-up companies of Fintech). The payment services ecosystem that has been created is entirely new, where banks have to change their roles significantly due to increased competition. Competition in all sectors is good, resulting in more innovative products and services.

Traditional financial institutions will try to maintain their competitive advantage, and their status as a “trusted agent” must be used to stop new entrants losing business and revenue. The goal should be to stay ahead of the competition by, for example, exploring data exchange agreements with financial services companies or developing a perspective on APIs and their benefit to the bank’s service model. The PSD2 has brought about a change in the mindset of traditional banks, raising the prospect of greater collaboration with Fintech companies as one of the most compelling reasons to join the Open Banking opportunity (Paul Rodgers, Chair and Founder, Vendorcom) (Marten Nelson, Co-Founder and Marketing VP, Token).

The key factor in the success of open data by banks will be the ability to build processes that ensure security and reliability without sacrificing speed - consumer confidence in the system is key. Barclays and Santander banks, which have extensive resources and an agile culture, have created open API infrastructures to offer a virtually unlimited set of services through third-party providers, for example, EverLedger (MacKinsey, 2018).

Javier Santamaría, the president of the European Payment Council, sees this regulation as very pro-competitive, however “there are no rules in the Directive that clarify how the integrations between players and the liberalisation of data are going to be dealt with. The legislator does not know what the fate of the transformation is”.

Spanish banks present different levels of progress on their way to digital transformation. Despite the fact that they are all aware of the importance of implementing their digital strategy, there are various limitations that are holding back this development. The firms with the greatest investment capacity can open up more lines of action to advance in their transformation than those institutions that have greater limits in terms of their level of work. It is important to bear in mind the concentration process experienced by banks in recent years, which has affected the capacity for digital transformation of some institutions by having to focus their efforts on restructuring and mergers. (FUNCAS, 2020)

5.4. Fintechs

Fintech is a term strongly associated with the concept of financial innovation. Fintechs are thus seen as companies that enable the introduction and adoption of innovative solutions across the financial industry. (Bratasanu 2017.) Technology startups have entered the financial industry in the first place because they have seen an opportunity in the technological

possibilities in the market and the inability for traditional banks to realize these possibilities fast enough due to the heavy regulation that is imposed upon them. Consequently, new Fintechs are born at an increasing pace to fill the gap between the technological possibilities and the adoption lag that banks are experiencing. (Buchak et al. 2018.)

The Fintech phenomenon introduces a new scenario of operations for banks and their clients, new rules of the game that affect all areas of the sector and have important consequences: the entry of new players (as active participants in the financial sector), the evolution of the framework of relations with clients in processes of buying and selling and provision of financial services and products, as well as the emergence of new and innovative business solutions of high value with the consequent impact on the way of working of traditional banks. (KPMG)

Fintechs have harnessed technologies such as artificial intelligence, machine learning, blockchain and natural language processing to offer often highly automated services to customers in an omni-digital environment (Romanova et al. 2018). The use of recent technology enables Fintechs to provide services more cost efficiently than banks by automating labour-intensive tasks and to operate completely online i.e. without having to establish physical branches (Pollari 2016, Zalan & Toufaily 2017). (Niemelä, M., 2020)

An increasing part of the new and innovative solutions introduced to consumers are produced by Fintech companies (Anyfantaki 2016). Fintechs utilize their technical expertise to create innovative services and make themselves attractive to customers by emphasizing factors such as easy onboarding, fast service, better functionality, simple user experience and serving previously underserved, or totally new, customer segments (Manasov & Ivanovska 2018, Oney 2018). Fintechs are often also focused on a niche consumer need or problem within the market and developing more specialized, customer-centric solutions for these problems (Drasch et al. 2018, Döderlein 2018). Consequently, Fintechs create more convenience for the customer. Buchak et al. (2018) note that one reason, why Fintechs succeed in providing convenience to customers is the efficient use of data to personalize offerings and to require less input from the customer. (Niemelä, M., 2020)

With the introduction of PSD2 in Europe, payment initiation and access to account information give a multitude of possibilities for innovation. The solutions facilitated by PSD2 specifically are related to payment initiation services (PIS) or customer account information services (AIS) in innovative ways (Cortet et al. 2016, Brodsky & Oakes 2017). The service concepts can be simple such as sharing expenses with friends (Venmo) or quite complex such as a completely digital neobank, with cards, payments, and savings features (Revolut). Other Fintech services can include e.g. aggregation of customers' financials across multiple banks to a single service (Tink), automated savings and investment solutions (Acorns), financial roboadvisory (Betterment), goal and theme-oriented savings (Qapital), on-demand insurances (Tröv), and much more.

5.5. Interaction between Banks and Fintechs

The situation described in the preceding paragraphs evidences the increasing importance of security-related aspects in the regulation in connection with access to payment accounts. For this reason, the PSD2 imposes the use of common and secure open standards of communication (CSC) for identifying entities, authenticating customers and notifying information, and for implementing the security measures that should govern relationships between the different payment service providers participating in a transaction. Thus, the aim is to ensure the integrity of funds, the confidentiality of information and the safeguarding of users' personalised security credentials. (Conesa)

However, the Directive does not prescribe a specific communication standard. Conversely, the PSD2 does expressly address one of the most controversial aspects of the main method used to date to access payment accounts by a third party: TPPs "impersonate customers" using their personalised security credentials and gaining access to their accounts in the same manner and with the same permits as the account holders, without identifying themselves as a third party. To mitigate the risks associated with this practice, the PSD2 obliges PISPs and AISPs to identify themselves to the ASPSP every time they access a customer's payment accounts. However, it does not prescribe a specific access model. Under the RTS, such identification is to be through the use of qualified certificates for electronic seals or for website authentication,¹⁹ which ensure the origin and authenticity of the data associated with a legal entity and authenticate the website linked to it, respectively.

In light of this, the RTS do not impose a specific form of access, allowing both that known as "direct access" and the setting up of "dedicated interfaces".

- Direct access consists in the use by a TPP of the communication channel established by the ASPSP for its customers (usually an online banking application), which is the customary channel on which PISPs and AISPs have based their business models and which they have been using to date to access information on their customers' payment accounts using "screen scraping" techniques. A priori, this is the access most commonly preferred by TPPs, which were already providing these services before the implementation of the PSD2. A substantial change wrought by the PSD2 in the use of this channel is that TPPs are now obliged to identify themselves as such when gaining access to customer information. From a technical standpoint, screen scraping is a programming method which, through reverse engineering, enables data to be extracted from a screen displayed representation (via a website or a pdf file, for example) and uploaded onto another application. In banking, this technique enables any entity with access to a customer's online payment account to extract and use the account data.
- Access by means of a dedicated interface involves the development by the ASPSP of a specific communication channel for the TPP other than the online one used by the entity's customers. Although not specified by the RTS, the practical implementation of this option will generally be assumed to take place through application

programming interfaces (APIs), the technique currently used by the industry for interconnection and development of applications.

5.6. Open Banking and APIs

Easy access to data has become a hot topic especially in the financial sector. Banks that have always seen the opening up of data more as a threat than an opportunity have also traditionally seen the custody and protection of their customers' data as a responsibility, more of a stewardship role than an asset to be commercialized. In contrast, new non-banking companies have proven to attract the customer and obtain new and valuable customer relationships by presenting data in a new format, they have turned data into an asset to be marketed.

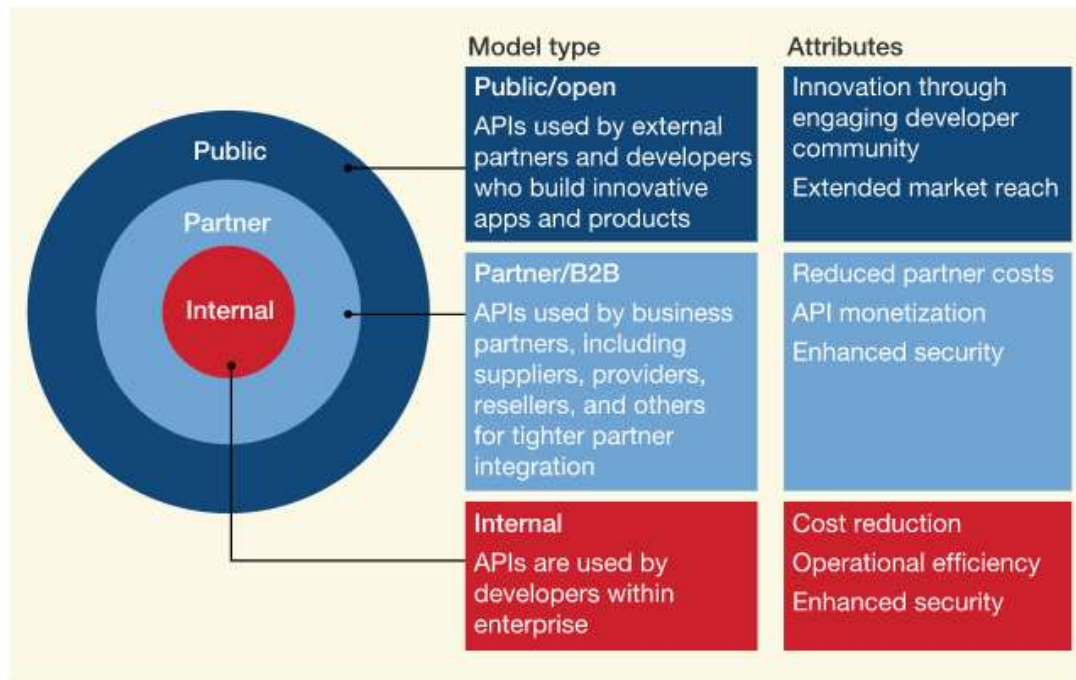
The financial industry has traditionally disposed of a large amount of data about its customers and their behavior that has provided valuable information about their habits, preferences, needs, etc. However, the practice of cross-referencing internal customer data and behaviors is relatively new.

The combined analysis of this internal and external information, both qualitative and quantitative, should enable entities to deepen their knowledge of the customer, allowing them to increase customer contact, quality, profitability, and retention. Information generally becomes more valuable when it can be compared and combined with other data.

In an increasingly digitalized economy, companies are looking for ways to activate the value of data. But data does not add value if it is not treated along the Data Value Chain (DVC) with the intervention of infrastructure, software, services and above all people. Fintech is an example of data exploitation to create business value and improve the shopping experience, optimize decision making or promote cultural change. Strategic vision is one of the main challenges (together with the capacity to integrate information) to achieve value from data. Companies that do not react will lose competitiveness in relation to the competition and market value.

Data sharing is often accomplished through an application programming interface (API), an intelligent conduit that allows for the flow of data between systems in a controlled yet seamless fashion (Exhibit 1). APIs have been leveraged in banking settings for years. Given breakthroughs in advanced analytics and the market traction of numerous nonbank fintech companies, however, APIs are receiving renewed attention as a means to enhance the delivery of financial services to both retail consumers and business. (McKinsey, 2020)

Scheme 2: API Models



McKinsey&Company | Source: McKinsey Payments Practice

The deployment of APIs will depend on whether they can conceive, create and communicate what the real benefits are to the end consumer. The balance between a great experience for the consumer and a system that demonstrates confidence and security will drive the economics of APIs. We will move from a “monolithic model” where consumers interact only with their bank, to a “banking platform model” where consumers take advantage of the implementation of APIs by multiple financial service providers and banks, this is what Open Banking is all about.

Open Banking can be defined as a collaborative model in which banking data is shared through APIs between two or more unaffiliated parties to deliver enhanced capabilities to the marketplace. The potential benefits of open banking are substantial: improved customer experience, new revenue streams, and a sustainable service model for traditionally underserved markets. (McKinsey) The way consumers interact with their financial data is changing, giving them greater flexibility and choice. This mark the beginning of a new wave of financial service providers, offering consumers better and more personalized offers in an attempt to gain market share from traditional banks.

5.7. The new Role of the Customers

The interaction between customers and the Third Party Providers (TPP) which offer payment initiation services (PIS) and account information services (AIS), as described in PSD2, is most effectively achieved through an open API infrastructure that enables a customer-oriented

experience: the customer is in control of what he can and cannot share with a third party, as the API is based on consent and permission.

With the implementation of the PSD2, the client becomes a key player in Open Banking, since without his consent, third parties cannot access his personal data. Therefore, both banks and Fintech companies of payment services try to improve their services in order to reach the customers' expectations and to achieve their loyalty. The increase in the number of enhanced digital solutions in terms of improved and low-cost services has grown the expectations of bank customers. Clients are no longer satisfied with carrying the bank in their pockets, in the form of mobile phones or applications that enable execution of daily banking services, such as making payments or transferring deposits. As digitalization and the use of personal data become a crucial part of meeting customer expectations, concerns about data security and privacy have become more demanding, which is something consumers expect and rely on financial services to ensure.

The main concern of Paloma Real (General Manager of Mastercard Spain) is the lack of knowledge by the customer of the PSD2 application, the final consumer lives totally unaware of this new circumstance. According to data from Mastercard itself, more than 55% (March 2019) of companies have not heard of the regulation and are unaware of the impact it may have on their business.

Transparency and customer control must remain at the heart of product design decisions. Therefore, educating the user about this new revolution in the payment service must be an essential task, even though it is complex. Different categories of data guarantee different levels of security, and informed consent requires an understanding of the consequences of sharing personal data before approving privacy policies that no one ends up reading about. Consumers must be educated and empowered without confusing, scaring or boring them.

5.8. Literature Conclusion

The PSD2 with the liberalisation of customer data and the removal of entry barriers for new operators has sought to "level the playing field" by creating a single integrated market for payment services with uniform approaches for banks, emerging payment companies and FinTech's alike. The introduction of greater competition in the banking sector has created larger markets with more and different types of players where new financial products and services are developed that are adapted to the financial profile of the client, optimising the use of their account and transaction data.

The winners will be those who think beyond compliance. It's not just about compliance with PSD2, it's about "what's beyond PSD2? What will open banking look like and what will your banking experience be like in the future? Companies that are proactive and agile, that anticipate change, will be the main beneficiaries of the change.

6. Research Methodology

The methodology followed in this section try to find answers both to the main question of the dissertation, and to the sub-questions exposed in the first chapter.

6.1. Research Strategy

The strategy to follow in this research project is divided between the theoretical and the empirical part. The main theme of the project, the PSD2, being a European directive, the first chapters will be dedicated to the theoretical part of the dissertation, which is a review of the literature on existing research on the subject. The literature review covers the essential topics for research and therefore provides a basic knowledge about the topic that will help to find knowledge gaps in previous research projects. These gaps are what this research project is intended to clarify and shed light on. The methodology proposed below aims to address those knowledge gaps that may be so important for the actors involved in the new financial payment system.

On one hand, the empirical part of the research will include a qualitative case study and data analysis. The main method chosen for data collection is that of semi-structured thematic interviews conducted with both Fintech company executives and open banking experts from the two of the major banks in Spain. According to authors Edmondson and McManus (2007), a qualitative method is preferable the more incipient the state of exploration and availability of the theory. Therefore, the decision to conduct the research as a qualitative case study is due to the novelty and complexity of the topic and the consequent lack of quantitative data to analyse. Another argument in favour of a qualitative method is the absence of quantitative and qualitative analyses previously carried out and reported in the context of the PSD2 in Spain, due to the recent implementation of the directive. Furthermore, even though quantitative data is inherently more accurate, the strength of qualitative research came when you are studying complicated matters, which require interpretation, assessment, and evaluation of different concepts (Walliman, N 2011, 73).

On the other hand, the research seeks to apply the quantitative method through a survey. Despite the fact that PSD2 has been implemented very recently in Spain, it can be argued that a change in the Spanish banking landscape is already visible today, as newcomers Fintech companies are already challenging traditional banks. A quantitative approach could therefore be used. However, in order to obtain meaningful results which can be analysed, an effect must be analysed which has a clear distinction between two time periods, a period representing 'before' the change and a period representing 'after' the change. As the supposed entry into force of the PSD2 is very recent (September 2019), the time period available for analysis will be short but sufficient to allow a survey of the Spanish population to be carried out.

6.2. Participants and Sample

The research study, using both the qualitative and quantitative methods, will have two completely different samples. Firstly, the participants in the interviews will be analyzed and secondly, the participants in the survey will be analyzed as well. The qualitative method used consists of four interviews with experts with a great deal of experience in the payments sector who are currently working in direct contact with the Spanish payments market. Two of the interviewees are directors of banks that offer PSD2 services and the other two are Head of Departments in Fintechs that act as TPPs. The presentation begins with the two bank directors, and then the Fintechs' heads are introduced. All the participants were carefully selected, after a previous analysis of the information that each one could give according to their current position and their previous experience in the sector.

The first of the interviewees is called Enrique, he works at BBVA, one of the three largest and most technologically advanced Spanish banks. The position he currently holds is Global Payments Strategy & Alliances Director, where he is mainly dedicated to defining the group's payments strategy, promoting digital and participating in the PSD2/SCA strategy as a way of differentiating oneself. In addition, he has worked as Digital Banking, Global Payments Director in BBVA Chile, for three and a half years, and also as Asia Retail Banking Business Development Director in BBVA Asia for 3 years, so he can be considered to have extensive international experience in the sector. The second one is called Ion, he works at Abanca, one of the main financial institutions in the Spanish market. The position he currently holds as Provincial Director has been held for 15 years, where his objective has always been to reconcile the best of traditional banking with all that is good in a cutting-edge bank.

Con respecto a las Fintech, el tercero de los entrevistados se llama Carlos, trabaja en Eurobits, una de las pocas Fintech españolas que posee la licencia para ofrecer servicios de pagos AIS y PIS. Recientemente la empresa ha sido adquirida por Tink, uno de los gigantes europeos en el servicio de pagos, además es el proveedor tecnológico de Fintonic, la Fintech española que mejor ha entendido el Open Banking en el país y que más éxito ha tenido. Él ocupa el puesto de Head of Payment Services, anteriormente había trabajado como Country Manager en España de una gran Fintech alemana de servicios de pagos llamada Sofort, que también ha sido adquirida por el gigante Tink recientemente. El último entrevistado se llama Benjamin, trabaja en Unnax, actualmente (agosto 2020) es la única empresa que posee la triple licencia; la doble de servicios AIS y PIS más la licencia de dinero electrónico (EMI). Él ocupa el puesto de Head of Product, anteriormente ha trabajado en diferentes Startups desarrollando interfaces dedicadas (APIs).

Concerning the Fintechs, the third interviewed is called Carlos, he works at Eurobits, one of the few Spanish Fintechs that has the double license to offer AIS and PIS payment services. Recently the company has been purchased by Tink, one of the European giants in the payments service. Eurobits is also the technological supplier of Fintonic, the most successful Spanish Fintech that has best understood Open Banking. He occupies the position of Head of Payment Services, previously he had worked as Country Manager in Spain for a large German Fintech of payment services called Sofort, which has also been acquired recently by the giant

Tink. The last interviewee is called Benjamin, he works in Unnax, currently (August 2020) the company is the only one that has the triple license; the double of AIS and PIS services plus the electronic money license (EMI). He holds the position of Head of Product, previously he has worked in different Startups developing dedicated interfaces (APIs).

Regarding the quantitative method, the target population was adult consumers aged 18-65 who have made an online payment or made use of online banking in the last 12 months (from May 2019). A proportional quota sampling methodology used to ensure a representative sample of the population in each location based on gender, age, nationality, and employment status (working, student, unemployed, ...). It is a simple and fast sampling process because it uses the participation of a quota for the creation of samples. In addition, the interpretation of the information is much easier for the researcher because the sampling by quotas and the well elaborated questions facilitate it. Finally, a representation of the effective population has been obtained using the GoogleForm program, without spending any money, completely free. The final sample size was 214 people, working with a 95% level of certainty at least 135 of those samples would be sure to represent the characteristics of the population. Appendix 2 contains the questions and answers of the survey with their corresponding graphics, as well as the link to access the online survey

6.3. Data Collection and Data Analysis

- **Data Collection**

This dissertation uses different data sources for the theoretical and the empirical part. To collect data for the literature review of the theoretical part, academic databases such as EBSCO and Google Scholar were used to gather research projects and reviewed articles on the topic. Some non-academic sources were also used, such as consulting firms like Deloitte, McKinsey, PWC and Accenture or the banks BBVA and Banco Santander, as the sources are generally trusted actors in the field of financial consulting. In addition, the websites of the Spanish Central Bank, among many others, have been accessed.

For the collection of empirical data, the method chosen was interviews and a survey. Data collection through interviews is the most appropriate option, especially with regard to the flexibility and openness of responses and the ability to go deeper into the subject with open-ended questions. Interviews can be divided into structured, unstructured and semi-structured interviews. Structured interviews minimize the role of the interviewer with a set of standardized questions, while unstructured interviews may have a topic or a pattern of questions but depend on the interviewer developing an open-ended conversation during the interview. The semi-structured interview is situated between the other two types of interview that contain both structured and unstructured parts. (Walliman, N 2011, 99)

The four interviews were semi-structured interview because it allows for an outline of topics and a set of basic supporting questions to guide the conversation, besides it is designed to allow for deviations and derived questions on the topic. The conversational and informal

environment, which includes more open-ended questions compared to structured interviews or questionnaires, allows interviewees to approach the topic more freely, discovering new ideas or associations by providing a deeper understanding of the topic (Eriksson & Kovalainen 2018).

The interview questions are individually tailored to those of the participants. There are two different interview formats (Appendix 3), those conducted with bank representatives and those conducted with representatives of Fintech companies. The first contact with the experts was through LinkedIn and by e-mail. Interviews were conducted by video and phone calls. The interview period was between July and August 2020.

The survey technique is widely used as a research procedure, as it allows data to be obtained and processed quickly, practically, and efficiently. This investigation procedure has, among other advantages, the possibility of massive applications and the obtaining of information on a wide range of issues at the same time. The sampling model used will be non-probabilistic sampling, of those we use is quota which is the one that best fits our idea of obtaining data. The survey was carried out using Google Forms, a tool previously used in other research projects that gives particularly good results, as it presents the data in a way that facilitates the interpretation of these.

• Data Analysis

Data analysis is the careful examination of data that allows investigations to discover new concepts and relationships between data. The process of data analysis is not rigid or restricted but is a continuous process that occurs throughout the research and includes an interaction of structured and unstructured elements. Data analysis is a unique process that takes its form in the interaction of the data collected and the researcher who interprets it (Saunders & Thornhill, 2016).

The interview will be divided into four main topics, which are causally related to the research question and the sub-questions outlined in the first chapter of the proposal.

1. The implementation of the PSD2 on Spanish bank market.
2. The impact of the PSD2 in traditional Banks and TPPs in Spain.
3. Open banking: the liberalisation of the client's data.
4. The new role of the consumer.

The data analysis process begins immediately after the first interviews are conducted. The data analysis process is repetitive in nature and often leads to two or more cycles of data review, analysing the relevant issues. For the purposes of content analysis in this research, the interviews will be recorded and transcribed by the author only. In the first phase of the content analysis, the data will be analysed by organizing the responses under selected themes found in the interview questions. In the second phase, the texts under different headings will be coded with an open-ended coding method to discover patterns such as keywords or feelings that emerge from the text. Open coding is best suited to examining a large amount

of data and conceptualizing it in an iterative manner by finding similarities and emerging concepts or dimensions within the data. (Walliman 2011: 133.)

The aim of addressing these issues in the interviews is to try to get the information that the research projects carried out so far have not managed to obtain, in order to fill the lack of knowledge that currently exists. For this reason, an exhaustive analysis of the data obtained from the interviews is essential, from this analysis depends that all the work has been worthwhile. If the interviews manage to offer an added value to the project, the research will have been a success.

The survey is carried out with the aim of understanding how consumers have responded to the new digital payment offers, seeing what level of knowledge they have about the radical changes in payments and the liberalisation of their own data. The analysis of the results of this survey is paramount to this research project, customers are the main actors of this whole new payment service process, if the real needs of customers are understood, the actors can offer the service in the way that benefits them most. The company or bank that manages to offer the payment services that most customers demand, it will have gained a competitive advantage over the other players, which may be the key to the organisation's success in the future.

6.4. Ethical Issues

Having consulted the Ethical guidelines for research with human participants the researcher ensured to abide by the Guiding Principles accordingly, this being referenced in the Dublin Business School Quality Assurance Handbook, 1.3.7 Ethical Guidelines. Besides, The statements made in Section 1: Declarations, demonstrate the author's good faith in respecting the Ethical Guidelines proposed by Dublin Business School.

6.5. Limitations to the Research

The main limitations found in this Research Project are the short duration of the directive in Spain and the current situation that the whole world is experiencing.

Firstly, the renewed Payment Service Directive (PSD2) having come into force in September 2019, by the time this project is carried out (May - August 2020) hardly more than half a year will have passed. As a result, there is hardly any work done in Spain on the subject with which to compare and draw new ideas. This limitation, however, does not make it impossible to carry out a study, since it is such a new and burning topic that there are many reports from banks and consulting firms, as well as academic articles on the subject.

Secondly, the unfortunate pandemic that is hitting the whole world is also becoming a limitation to develop the project. The impossibility of having close contact with other people limits the research methodology. It also makes it difficult to access sources of information

because the libraries are closed. Fortunately, in the world we live in today thanks to new technologies, interviews can be conducted by video call or simply by phone, and there are many books in digital format that can be accessed online.

Lastly, all the interviewees were delighted to participate in the dissertation since the first moment, although, they never let me record the conversations that we had. Therefore, the data has been analysed directly from the raw notes took it by the author during the interviews. For this reason, it has been impossible to attach the answer sheet of the interview.

7. Results

This part presents the empirical findings of the study, which is based on 4 semi-structured interviews with 2 Spanish banks (large and medium size) and 2 Spanish FinTech operating with payment services; and one survey carried out among mostly Spanish clients who make daily use of the payment services offered by both banks and Fintech. The chapter is divided into two sections: a) the Qualitative analysis of the interviews, and b) the Quantitative analysis of the survey.

7.1. Qualitative Analysis

In the first section, the four interviews conducted with the different agents of the Spanish banks and Fintech are analyzed. To carry out the quantitative analysis of the interviews, the model used as a guide is presented in the section called "Using thematic analysis in psychology" belonging to the "Qualitative Research in Psychology" book written by Virginia Braun and Victoria Clarke. For the analysis of the information obtained from the interviews, a thematic analysis has been carried out, since it is the most correct and effective way of examining them. For this purpose, the 6 steps proposed by Braun and Clarke have been followed.

The first step has been to become familiar with the data and notes obtained from the interviews conducted, comparing the information and opinions provided by each of the interviewees. Secondly, synergies have been sought between the codes obtained from the different actors, to group and gather the relevant information to create topics that can potentially be used in the discussion of the paper. In the next step, potential themes were checked against the extracts coded in the previous step and the entire data set obtained, in order to create a thematic "map" of the analysis. In the following step, further details were given by defining the name of the themes and discussing the ideas that should be addressed in each of the themes in the Results section. Finally, the last step has been the development of the final report where we have sought to relate the analysis to the research questions and to the review of the literature, in order to produce an academic report of the analysis.

The thematic model of conducting the interviews has facilitated the task of analysing the information and codes obtained. The interview questions are divided by topic, and the answers are also mostly themed, which has helped to relate and compare the codes and data offered by the interviewed actors. In addition, the interviews have followed a historical line based on the topics covered in the literature review. Starting from the beginning of the PSD2, going through the activity and current position of each actor, to the possible future of Open Banking in Spain, it has facilitated the creation of the thematic "map" mentioned in the previous paragraph.

Finally, the topics chosen are: the implementation of the PSD2, the impact it has had on the different players, the payment moratorium, the added value of each player, the relationship

between banks and third party providers (TPPs), the real value of the opening of data and the possible PSD3.

7.1.1. The implementation of the PSD2 in Spain

The PSD2 is a European regulation on electronic payment services which aims to increase the security of payments in Europe, improve customer protection, bring about competition and innovation in the sector and encourage the adaptation of banking services to new technologies.

Each of the actors interviewed offers their vision from the different positions they hold within the payments market of how PSD2 has been implemented in Spain, but they all reach the same conclusion. On the one hand, Benjamin (Unnax) believes that Spain is one of the worst markets in Europe in terms of implementing the PSD2, because when the date agreed with the EBA to start applying the new directive was reached, there was a long delay in developing the banks' APIs, which did not provide the expected level.

Enrique (BBVA) goes a bit in the same line as Benjamin by saying that there are currently two types of banks in Spain with respect to their technological development, the largest banks such as BBVA, Banco Santander and La Caixa which have a lot of capacity for technological development and have been preparing for the arrival of the PSD2 for a long time. However, there are other medium and small banks with less labor and technological capacity which have been caught by surprise by the PSD2 and have no room for maneuver.

Carlos (Eurobits) believes that the implementation of PSD2 is in an early stage, despite seeing Spain as a pioneer in the technological field where all banks have an account aggregation application. He still has the impression that not even the players themselves know very well what to do with the data, they are still far from really knowing how to use the information and offer added value to customers such as cross-selling and up-selling services.

7.1.2. Payment Services Moratorium

The situation described by Enrique in the previous section, where technological progress differentiated large from medium and small banks, forced the Spanish Central Bank to conduct a round of checks among banks and large businesses in Spain to see if they were prepared for the implementation of the PSD2. The result was not positive, several players showed that they were not yet ready and that they needed more time. After the relevant verifications, the Spanish Central Bank asked the EBA in September 2019 for an extension to relax the initial deadline for the implementation of the PSD2. Enrique assures that BBVA is very prepared, they could start working tomorrow if necessary, they are very advanced, but they still have much to improve. They have different APIs Markets with different levels of

development focused on various markets (USA, Colombia, Mexico, Spain, ...). They are currently working on unifying all the APIs into a single API market, with the aim of becoming one of the first banks internationally to make use of a single API for all markets in which they operate.

For his part, Benjamin doubts very strongly that at the speed that the banks have advanced and updated themselves over the last 2 years, they will be up to speed by the end of the extension in December 2020. Even so, he points out that it is difficult to anticipate, the development during the second half of 2020 will be decisive to see if the banks and businesses arrive on time. He does not think that the regulator will force TPPs to use 100% APIs if banks do not improve the performance of their APIs to the level they should. It is important to know that the ETTPA (European Third Party Provider Association) of which Unnax is a member, is dedicated to participating in discussions with European regulators and banking authorities, in order to identify the points where the banks' APIs are not at the level and which do not allow TPPs to offer the same services they previously offered. This partnership puts pressure on European regulators to adjust in favour of TPPs. Although improvements are being made month by month, it is a slow process that will take months or years to get up to speed.

7.1.3. The Fintech

There is no single definition of what a FinTech is, but it commonly refers to a financial company that adds value to the customer by utilizing technology to provide one or several things of reducing cost, increasing revenue, or removing friction. Despite referring to a company, the word FinTech stems from “financial technology”. (Ståhl, 2017)

- **Two types of Fintechs**

Carlos, expert in Fintechs, due to his extensive experience working on them, divides the current Fintechs depending on the time of creation, the pre-PSD2 and post-PSD2. On the one hand, there are the lifetime payment service providers that have been in the market for more than 15 years and the new companies that have been born as a result of the PSD2. Fintech companies such as Sofort (AISP) and Eurobits (PISP) have always acted without being regulated or supervised, accessing their clients' accounts through the Users Interfaces. Now, with the PSD2, these services have been regulated and the entire banking industry (the ASPSP) has been forced to expose their payment account information through APIs. On the other hand, there are the new companies that still do not really have business or customers and that offer AIS and PIS services at very economical prices to start with and be able to build customer loyalty.

Regarding the impact of PSD2 on Fintech, Carlos adds that the companies most affected are those that have been working in the payments market for the longest time. For the new companies everything is new, they explore directly the APIs and they manage to get as much information as possible from their customers. However, companies that have been working for years using Users Interfaces such as screen scraping, find that the APIs developed by the banks lack sufficient quality so that the service they had been offering previously did not deteriorate. The regulator cannot force Fintechs to stop accessing information through the screen scraping technique until the APIs provided by the banks are up to the regulation, otherwise these Fintechs would see their business endangered.

- **Fall Back Mechanism**

In relation to the malfunction of the banks' APIs, Benjamin explains how Unnax, despite the fact that the PSD2 is in force, thanks to the fall back mechanism will be able to continue offering PIS and AIS services to its customers whenever it is proven that the bank's API was not up to standard. The fall back mechanism allows the PISP and AISP to make use of the direct access through the interfaces offered directly by the ASPSP to its customers through online banking, in case the API does not work properly. The EBA accepts this mechanism to protect the TPPs, since it knows that the APIs of the banks are not yet at the level, so it continues to allow the use of screen scraping.

Benjamin explains that the fall back mechanism should be a temporary solution, since TPPs prefer the use of APIs in the future, even though at this time they get less information. TPPs using the screen scraping technique depend totally on the stability of the bank, if you change a single functionality of the bank's page, all the screen scraping technology of the TPPs has to be updated according to the changes, assuming huge maintenance costs to keep the services always up to date. By using APIs, services are much more stable and economical, as you no longer depend on possible future changes to the bank's web pages and you save on updating costs.

The aspect that most concerns Benjamin and for which he believes that Spanish Fintech companies are at a disadvantage is the long period of time that they have to wait until they get the licenses in order to offer the PIS and AIS payment services. According to the British website "Open Banking Standards" the average time to obtain a PSD2 payment service license in the UK is between 3-6 months, in Ireland it is even shorter between 2-3 months. However, in Spain Unnax has taken almost 2 years to obtain the licenses. Unnax believes that this delay in obtaining licenses is due to the power of the banks and the influence they have on the Central Bank of Spain, the regulator of PSD2 in Spain. Banks are not interested in opening the door to the entry of new players that would mean more competition, since the interest of large businesses and banks in Fintech increases after obtaining these licenses.

- **BigTech Threat**

Cuando Enrique es preguntado sobre si las Bigtech pueden ser una amenaza para los bancos y las Fintechs que ofrecen servicios de pagos, pone el ejemplo de Apple. Si Apple decide convertirse en agregador de cuentas bancarias por supuesto que sería una gran amenaza. Dispone de muchas ventajas competitivas como fabricar dispositivos móviles de gran calidad, poseer una cuota de mercado impresionante y una interfaz de usuario buenísima. Además te agrega en el iPhone la información de todas tus cuentas con unos gráficos y una interfaz de usuario que ningún banco es capaz de replicar.

Una Fintech como Apple consigue sus márgenes de beneficio vendiendo dispositivos móviles, por ello Enrique afirma que únicamente se metería en el mercado de pagos si se cumpliesen las siguientes condiciones: a) Siempre y cuando Apple entienda que entrar en el mercado de pagos le ofrezca una nueva ventaja competitiva para vender más terminales, ya que es donde saca el margen de beneficio a su negocio. b) Siempre que no le afecte la regulación bancaria, lo que no quieren la Fintech es que les regulen como si fueran un banco. Por el momento están funcionando muy bien los servicios de pago que ofrecen Apple-Pay y Google-Pay, porque están actuando al margen de la regulación. En el momento en el que el regulador les exija regularse como si fueran un banco, automáticamente les dejará de interesar el negocio de los pagos.

Por su parte, Benjamin cree que pasarán años hasta que las BigTech sean capaces de ofrecer los productos al nivel de calidad que los ofrecen las Fintech dedicadas al mercado de pagos. No le preocupa demasiado la aparición de las Bigtech en el mercado de pagos, aunque sí las ve como posibles amenazas en el futuro si finalmente deciden entrar porque tiene los recursos y clientes suficientes para entrar a lo grande. Sin embargo, él destaca que las Fintech que llevan años en el mercado de pagos tienen la experiencia en el sector financiero y bancario como ventaja competitiva respecto a las Bigtech. Benajmin vaticina que si las BigTech acaban entrando en el mercado de pagos, lo harán a través de actores ya establecidos en el mercado.

7.1.4. The traditional Banks

When Enrique is asked if Bigtechs can be a threat to banks and Fintechs offering payment services, he gives the example of Apple. If Apple decides to become a bank account aggregator it would of course be a big threat. It has many competitive advantages such as manufacturing high quality mobile devices, having an impressive market share and a very good user interface. It also aggregates on the iPhone the information of all your accounts with graphics and a user interface that no bank is able to replicate.

A Fintech like Apple achieves its profit margins by selling mobile devices, which is why Enrique claims that he would only enter the payments market if the following conditions were met: a) As long as Apple understands that entering the payments market offers a new competitive advantage to sell more terminals, as that is where it gets its profit margin from. b) As long as

it is not affected by banking regulation, what Fintech does not want is to be regulated as if it were a bank. At the moment, the payment services offered by Apple-Pay and Google-Pay are working very well, because they are acting outside the regulation. The moment the regulator requires them to regulate themselves as if they were a bank, they will automatically lose interest in the payments business.

Meanwhile, Benjamin believes that it will take years for BigTech to be able to offer products at the level of quality offered by Fintech dedicated to the payments market. He's not too worried about BigTech's emergence into the payments market, although he does see it as a potential threat in the future if it finally decides to enter because it has enough resources and customers to go big. However, he points out that Fintech companies that have been in the payments market for years have the experience in the financial and banking sector as a competitive advantage over Bigtech companies. Benjamin predicts that if BigTechs end up entering the payments market, they will do so through players already established in the market.

Both Enrique and Benjamin mention the existence of an initiative in the different European countries to unify the banks' APIs, in Spain it is called RETSIS. Enrique comments that all Spanish banks are starting to publish their APIs in RETSIS and are beginning to test them. In addition, he knows that BBVA's APIs are among the most advanced in the market, for example, comparing volumes that are being treated in PIS services. BBVA is the one that moves the most volume among Spanish banks, even though it is still a very small volume to be all in the testing phase and taking their first steps. Benjamin adds that each country has this platform to unify and centralize the APIs of the most important banks, with a technology standard that all banks must apply. Unnax that has just obtained the PIS and AIS licenses is starting to test the APIs of the most important banks, although it sees that they are not yet at the level. They cannot cover all use cases as they did with the screen scraping technique before, there are many details that are not ready and there is a lack of access to customer information.

7.1.5. Interaction between Banks and Fintechs

In the section on access to clients' bank data by TPPs all interviewees agree, since it is an activity set by the PSD2 directive. Ion comments that prior to PSD2, the bank has always tried to block Fintechs from accessing their clients' accounts through screen scraping, blocking for example their IP. Today, the PSD2, by its own definition of opening its clients' information, allows for the creation of new business models such as payment initiation services (PIS) or account aggregation services (AIS). If the TPPs have the payment service license, it is legal that with the prior consent of the client they have access to their banking information, the bank in no case can oppose the opening of the data through the APIs; and as mentioned in previous sections, if the information is not obtained through APIs, it will be obtained via screen scraping from now on, always with prior authentication.

Although the initial idea of the regulator is to create some competition in the field of payments so that new opportunities and new players arise. Enrique insists that the spirit of BBVA is collaborative in the case that there is a Fintech as a payment initiator that has a relationship with a large mass of clients that could serve BBVA to attract new clients and offer them some kind of cross-selling service. In this particular case, they would of course collaborate by being payment initiators in a segment that interests them. AIS and PIS services are not limited to the Fintech world, so BBVA as a bank has decided to become a payment initiator, as it has a relationship with a large number of businesses to which it provides Point of Sales (POS) services, which accept payments with cards and virtual currencies. By becoming a payment initiator, BBVA does not approach the issue as if they were competitors of the current Fintechs that act as TPPS, but understands that by having a network of commercial relationships not only with individual customers but also with large businesses, it can offer payment services to companies so that they can accept card payments or digital payments.

Benjamin thinks it is complicated to define the relationship between banks and Fintechs, since they have a double relationship. Firstly, it could be thought that they are direct competitors since the Fintechs are providing the technology to the neo-banks (N26 or Revolut) that are taking away many clients from the traditional banks. Basically, the Fintechs are providing direct services to the direct competition of the traditional banks. At first sight it may seem like a direct competition relationship between banks and TPPs, however, the reality is quite different. Fintechs can also improve the services that banks offer to their clients, giving them more flexibility on the financial health of their clients' accounts, helping them to offer cross-selling or up-selling services based on how they detect their users' behavior, reducing costs, increasing the visibility of the actions taken by clients in other banks...

Enrique considers that the degree of competition between banks and TPPs will depend on the way they act in each case, if both the bank and Fintech are trying to close a payment initiation agreement with a merchant, then there would be direct competition between them. On the other hand, if Fintech has a trade agreement with a large company with a large customer base that is of interest to the bank, then it would be in the best interest of the bank to cooperate with that Fintech. BBVA is clear that technology will be an enabler for the bank to compete, but the real competition will be in the commercial agreements that each player manages to close. Obviously, a small bank that has less advanced technology because it has not had the resources or vision to develop will be at a disadvantage in competing for customers in the short/medium term. The big banks have seen this technological revolution coming and have been investing in it for more than 2 years. A great range of new business opportunities is opening up to them and at the same time they are facing the arrival of new national and international competitors. On the contrary, medium, and small banks have lost competitiveness with respect to large banks because they have been left out of being able to offer these new PSD2 payment services that require significant technological innovation investment.

Benjamin argues that banks and Fintechs should not compete with each other, rather they should help each other develop. The big problem he sees is that many banks have been slow to realize the importance of technological innovation within the banking system. He

acknowledges that some banks have started to change their mentality, and it is being observed that at the European level, banks are starting to invest in Open Banking companies. For example, an important Spanish bank called Bankinter has entered as an investor in Unnax by acquiring part of the share capital and contracting the payment services offered by the company. This bank has understood that Open Banking is the future, it is better for them to take advantage of these technologies to improve the user experience, which is what the market currently demands and values.

Finally, Benjamin exposes the limitations that some banks have in their capacity to innovate and integrate new technologies internally. Banks, having always enjoyed a historical monopoly, do not carry in their DNA the innovative spirit that characterizes Fintech, they are not used to changing and improving processes or redefining their business models and building new financial products. Therefore, the way banks find to innovate is by buying Open Banking players that start to be successful, it is usually a law of life for Startups that when they reach a critical size, they are usually acquired by a bank. The problem comes when a bank acquires a Startup, does not know how to manage it or integrate it into the bank's system, or improve the added value of Fintech. What Benjamin is complaining about is that banks buying startups that are beginning to grow and stand out in the market to solve their problems of technological obsolescence, the only thing they achieve is that Fintech loses value and ends up disappearing because of the banks' inability to integrate and follow up on that company. Banks cannot go buying businesses that look like they are going to be successful and if in the end they don't work jump to another business without taking into account that they are destroying a Fintech.

7.1.6. Data Sharing and Open Banking

Open Banking and the opening of customer data allows a TPP to contact a bank to aggregate a customer's account or initiate a payment on behalf of the customer from the bank itself as long as the customer has given their authorization. The bank may not oppose or hinder offering these services due to the application of the PSD2, however, it must guarantee that it is the customer himself who gives his consent by requiring his name and user keys, and as a novelty of the PSD2, it will also require the double factor of authentication.

Carlos states that currently, user financial data is the new gold. With all the financial information of the clients, it is possible to offer many services: for example, to profile a client better to offer better services, or to cross-sell and up-sell them to offer complementary services to those they already had.

Unnax, as the only Fintech with the triple license to offer PSD2 services, has a huge competitive advantage over its competitors. However, it is clear that in the future the competitive advantage will become a commodity, since it is only a matter of time before the other Fintechs obtain the PSD2 licenses. Benjamin goes deeper into the subject, revealing that the real value of the Open Banking industry is not within the PSD2 licenses, but within the

data that is held. As Carlos pointed out, the banking sector is facing a crucial moment. For the first time in its history, banks are being forced to open up their client data.

No one has ever had such depth on the financial behavior of both individuals and companies, except the banks that had the banking information of their client's accounts with them. Today, with the implementation of PSD2, the actors through AIS services have a 360-degree view of the data of all their clients' accounts even though they have them in different banks. This is where Benjamin maintains that the true value of Open Banking lies. The day will come when some actor will be able to read, analyze and give value to all this data to advise their clients on which financial decisions to make, how to improve financial behavior or how to make better operational flow decisions. This actor is assured of success, since he will have taken advantage of the great competitive advantage that Open Banking offers and will have offered the most complete and beneficial service for the clients.

When Enrique is asked if BBVA plans to benefit from account aggregation services (AIS) to snatch customers from the competition by offering them better financial products and services, he assures that at this time BBVA is not exploiting customers' personal data, as there could be a data processing problem with respect to the GDPR that is very sensitive, so they must be careful in these matters. For its part, BBVA seeks to benefit from AIS services by offering a quality user experience so that the customer is delighted with the bank and does not want to move to any other. Enrique does not close the door to future use of customer data, always with prior authorization, to offer cross-selling and up-selling services, although for the moment BBVA has no idea of offering these services in the short term.

7.1.7. The PSD2 is outdated. Is a new PSD3 possible?

Enrique thinks that the PSD2 is going to end up fulfilling the objectives previously mentioned in the definition of the new directive but believes that a new revision of the more updated regulations is necessary. In relation to the objective of guaranteeing competition, the regulation has become obsolete, because since the PSD2 has begun to be accepted, new agents have appeared such as Apple-Pay or Google-Pay without any need to be regulated. Benjamin, like Ion, thinks that several aspects and requirements are missing to consider PSD2 as finished. Both predict a more than safe PSD3 due to the existence of gaps and certain leakage points in the PSD2 regulation that give rise to different interpretations. So, if you really want to make a jump to Open Banking at 100%, regulations will have to evolve to adapt to the constant changes in the market.

Despite the fact that we are at the beginning of Open Banking in Spain, Carlos imagines that the day will come when there will be a PSD3 that will not only regulate payment accounts, but will also regulate deposits, pension plans and even investment funds. In short, to regulate all the services that a client may have within his accounts, going from Open Banking to Open Everything. According to Carlos' Open Everything theory, Benjamin predicts that there will come a time when there will be a unification of all Open Banking services. There will be a few companies that will win the game and every customer will have their Open Banking Passport

that they can use at any bank to pay, get a credit, take out a loan or a mortgage. On the contrary, Enrique does not believe that the unification of all banking services is a priority for the European regulator (EBA). He doubts very much that the EBA will focus on that, rather he should focus on updating the PSD2 that has become a bit obsolete and to start working on the next versions of the regulation to include all the new agents.

7.1.8. Impact of the COVID-19 outbreak on PSD2 and Open Banking

When interviewees are questioned about the possible impact of the COVID-19 on the implementation of the PSD2 and Open Banking in Spain, none of the respondents has a formal answer to such a question. Carlos believes that it is very difficult to determine at this time the real impact of the pandemic, we will have to wait several months or perhaps years to see it in perspective to make a more effective assessment of the impact. He is of the opinion that confinement has encouraged the growth of digitalization of processes, so it will accelerate Open Banking.

From Unnax they highlight that the COVID-19 crisis has triggered the need to reduce costs and accelerate processes. Therefore, more banks are learning about the importance of Open Banking than before the crisis. This situation is very positive for Fintechs like Unnax. On a business level, Unnax has never had as much consumption of its products by its clients as it does now. The use of its technologies has skyrocketed in an incredible way, this situation is understood to be linked to the changes in customer needs caused by the pandemic.

7.2. Quantitative Analysis

In this second section, we analyze the most significant answers of the questionnaire carried out to measure the degree of knowledge of bank clients about the PSD2 and Open Banking. The graphs analyzed have been constructed manually using the same results obtained from the questionnaire. In addition, we seek to know the predisposition of the clients to benefit from the new revised directive by opening their data to the TPPs.

The survey is attached in Appendix 2. In this section, the most representative responses to the questionnaire are studied. The questionnaire consists of 20 questions divided into 3 different sections; the first section, entitled "Client & Banks Relationship" consists of 11 questions and seeks to understand the relationship that customers have with their own banks. The second section, entitled "PSD2 & Open Banking" consists of 6 questions that seek to measure the knowledge of clients about the new PSD2 directive and the Open Banking phenomenon. Finally, 4 questions of a demographic nature are asked in order to get to know the participants in the questionnaire a little better.

- **Relationship Client & Banks**

Table 1 shows that 40% of respondents have accounts at only one bank, 35% have accounts at 2 banks, 12% have accounts at 3 banks and 10% have accounts at 4 banks. This question is very interesting since it shows that almost 60% of the respondents have several accounts in different banks. This large percentage of clients could be very interested in account aggregation services (AIS) to control the accounts of all banks.

Table 1: In how many different credit institutions do you have a bank account?

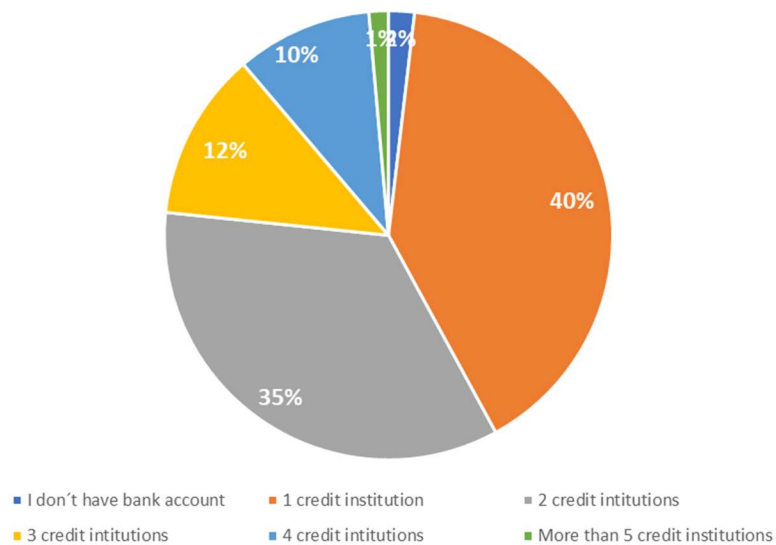


Table 2, Table 3 and Table 4 are discussed together below. The three questions focus on how clients value the services offered by their own banks. Table 2 answers a more general question, asking to measure the services offered by banks to their clients. The results are very positive, with nearly 90% of clients either happy (47%), very happy (36%), or delighted (5%) with the services offered by their banks. In addition, the absence of anyone rating the services as poor (worst possible rating) stands out positively.

Table 2: How would you rate the services offered by your banks?

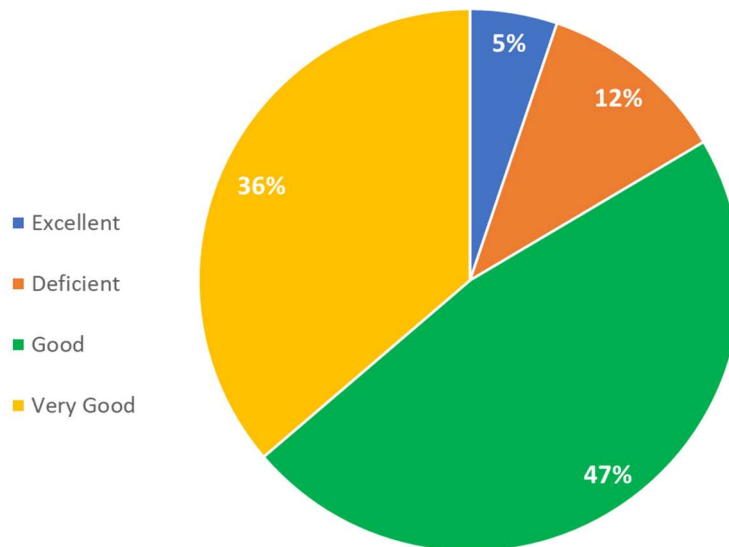
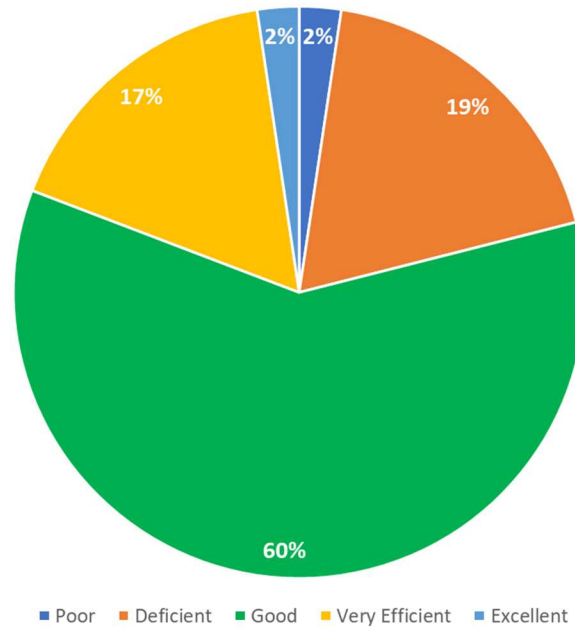


Table 3, which evaluates the communication capacity of the banks with their clients, also shows positive results for the banks, although a little more moderate than Table 2. Adding the positive ratings, they are around 80%, however, both the rating Excellent (2%) and Very Good (17%). As a result, the Poor rating has increased to 19%.

Table 3: How effective do you think is your banks' communication with its clients?



Finally, Table 4, which measures how innovative clients see their banks, gives us practically identical results to those obtained in Table 3. Positive ratings are again close to 80%, with minimal increases in the ratings of Excellent (4%) and Very Good (19%). The negative ratings are exactly the same as in the previous table, Poor (2%) and Deficient (19%).

Table 4: How innovative do you think are financial services offered by your banks' app?

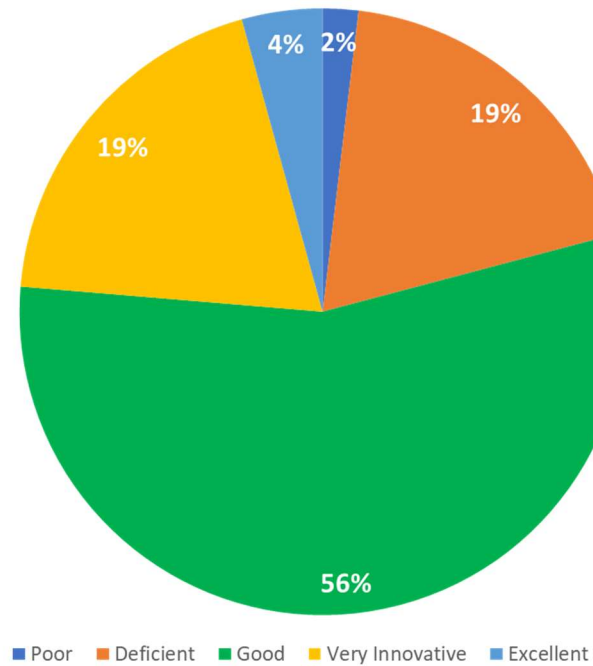
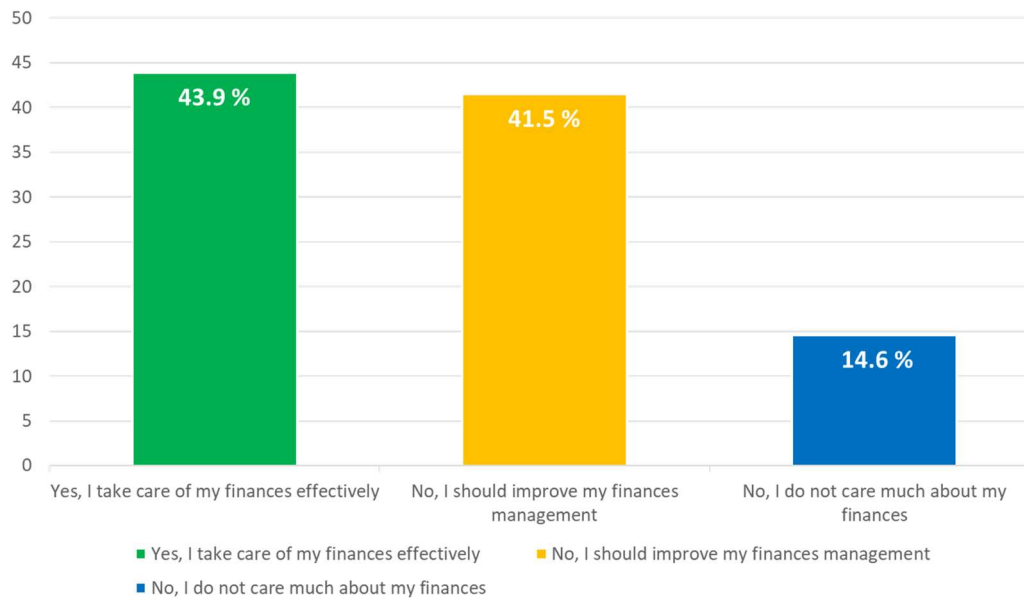


Table 5 presents the results of the question that may have made respondents think and reflect the most, they should assess whether they manage their personal finances efficiently. The surprising thing about the answer is that only 44% think they manage their finances efficiently and profitably. Of those who acknowledge not managing their money correctly, 41.5% are willing to improve and 14.6% do not give any importance to managing their finances.

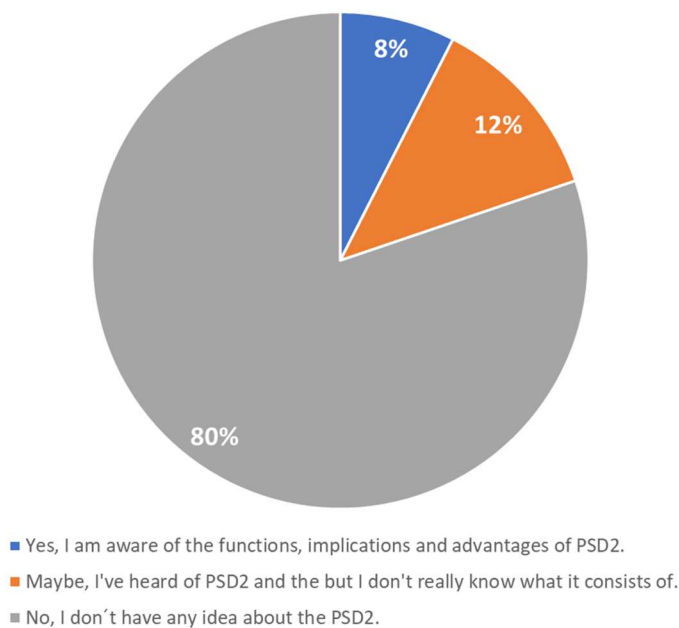
Table 5: Do you think you manage your personal finances in the most effective and cost-efficient way on your own?



- **PSD2 & Open-Banking**

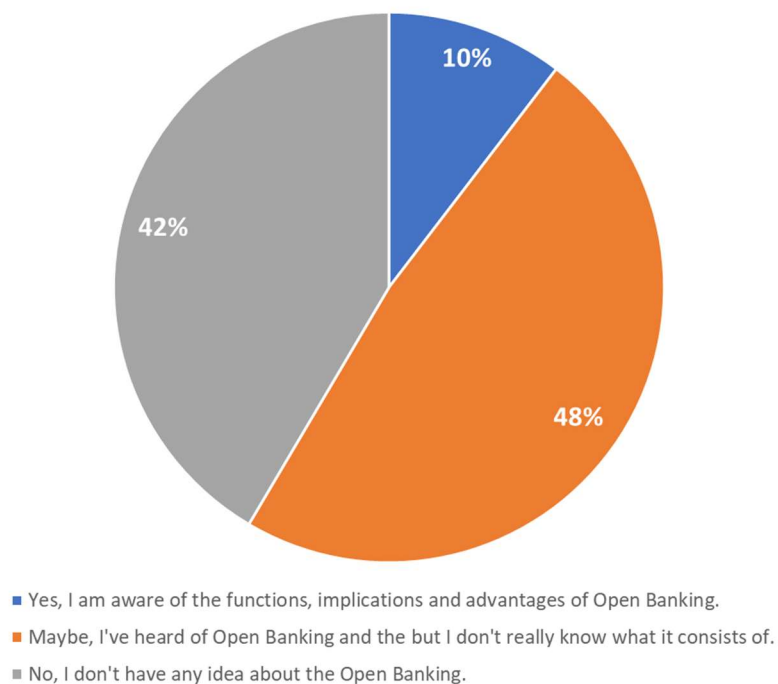
Table 6 and Table 7 are analyzed together, the questions are similar, they have the same objective, they seek to measure the level of knowledge of clients about PSD2 and Open Banking. The results of Table 6 show that 80% have not even heard of PSD2, 12% have heard of it but do not really know about it, and only 8% of the respondents are aware of the functions and implications of PSD2.

Table 6: Do you have any idea about the Payment Service Directive 2 (PSD2)?



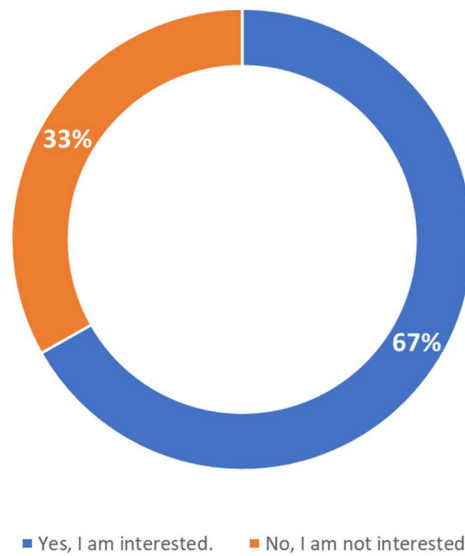
In Table 7 the results are similar, since as it happened with PSD2 only 10% know the implications and advantages of Open Banking. The main difference with respect to the previous table is the increase in the number of people who have heard about the subject (48%), leaving 42% of those surveyed who have no idea what Open Banking is. The increase in the number of possible connoisseurs of the subject may be due to the more commercial nature of the term Open Banking with respect to PSD2.

Table 7: Have you heard of Open Banking before?



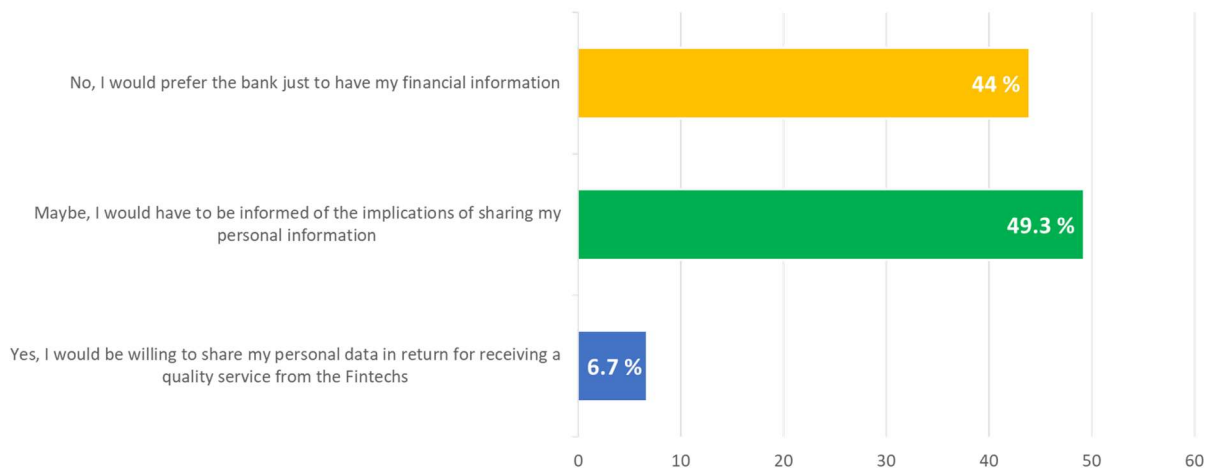
To finish this second section of the questionnaire, two questions are launched that seek to know the future predisposition of the clients in reference to the PSD2 and the opening of the data. Analyzing the results at a glance, it is clear that clients are interested in knowing more about PSD2, but they are still a little afraid of opening the data to Third Party Providers (TPPs). Table 8 offers significant rounded results, 2 out of 3 people are interested in learning more about PSD2 and Open Banking.

Table 8: Would you be interested in having more information about the new Payment Service Directive (PSD2) and Open Banking?



The results in Table 9 are a little more conservative, as only 6.7% of the respondents are currently willing to open up their personal data to third parties. The positive fact is that 50% would be thinking about it, with a good explanation of the implications and advantages that data sharing and PSD2 will offer, many would be easy to convince. Finally, 44% of the people surveyed are happy with the services offered by their banks and do not think it is necessary to open their financial data to any Fintech company.

Table 9: One of the features of PSD2 is the authorized opening of clients' personal financial data to third party companies (Fintechs). Would you be willing to share your personal data with Fintechs specialized in accounts management?



- **Demographic Questions**

The last 4 demographic questions are designed to give you an idea of the characteristics of the average survey participant. As shown in Table 10, it is considered a young audience, almost 80% of the respondents are between 18 and 35 years old, 35% are between 25 and 35 years old and 42% are between 18 and 24 years old.

Table 10: What is your age?

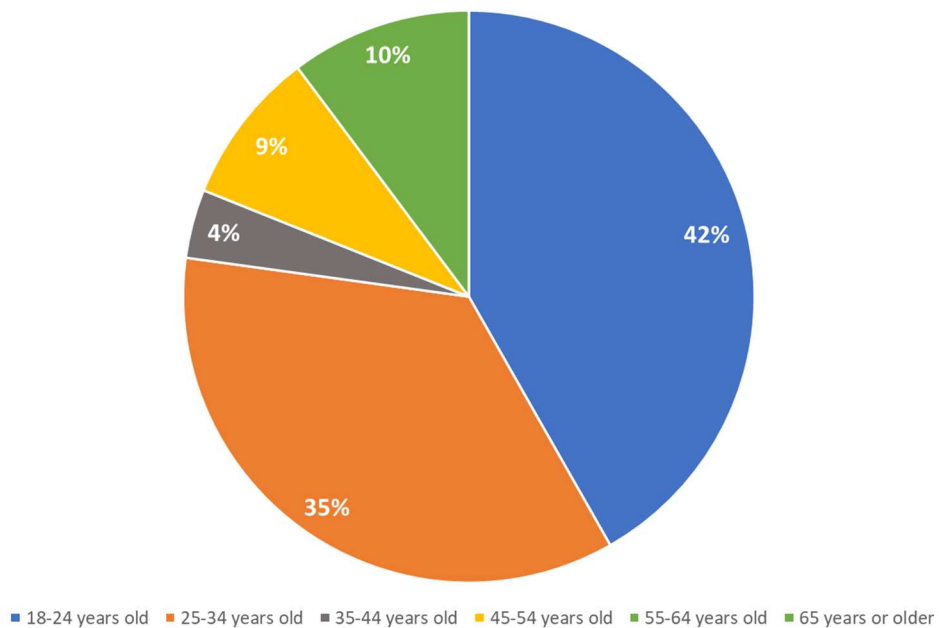
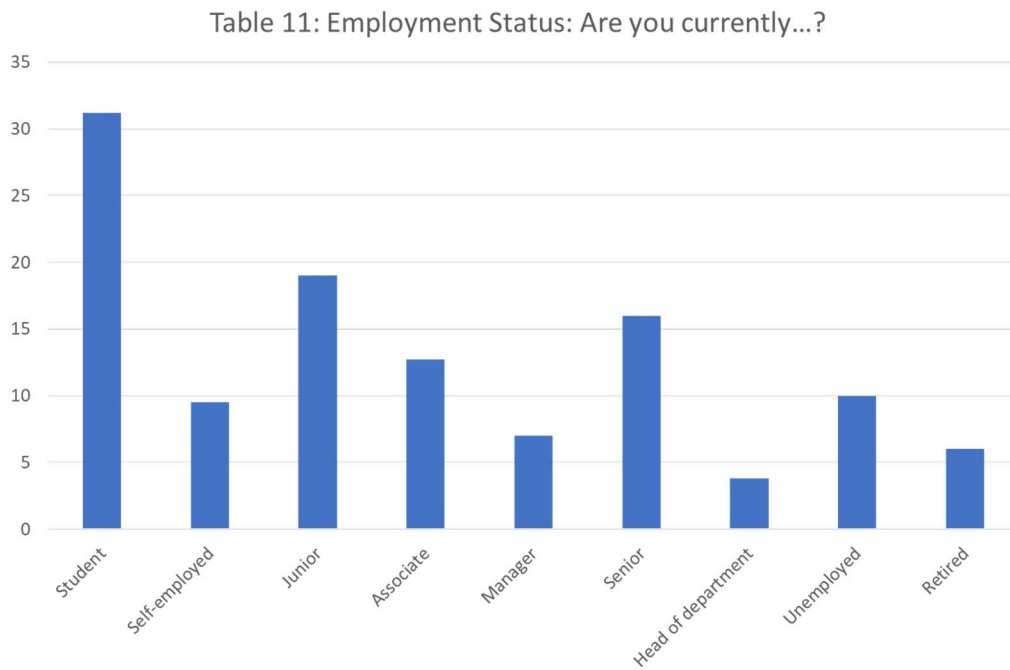


Table 11 presents the Employment Status of the respondents, where students (32%) and Junior positions (18%) stand out. These results are in line with the previous results of Table 10, where the young participants who represent the short- and medium-term future of banking are highlighted.



8. Discussion

This chapter provides a critical discussion of the empirical findings and the analysis and discusses the reliability of the interviews and the survey.

The main objective of the research project is to address the implementation of PSD2 in the Spanish payments market, focusing especially on the three main players involved in the payment processes; the banks, the Fintechs that act as TPPs and the final customers. As the PSD2 is so recent, there are very few writings about the evolution of the first year of the new payment regulation. The lack of updated information on the current situation of the PSD2 in Spain is the gap that this research seeks to fill. With this objective in mind, an article by the Spanish Central Bank entitled "A new regime for access to payment accounts: the PSD2" has been chosen to examine the implications and discuss the conclusions if necessary. The article will be published in November 2018 by three experts in the field, as well as workers from the Central Bank of Spain, the body that regulates the PSD2 in Spain.

Most of the economic articles that appeared in August and September 2019 in Spain presented the wonderful payment services that the PSD2 would offer users with a number of advantages, including increased security in payments, improved consumer protection and the promotion of competition and innovation in the sector. These press articles and descriptions of the PSD2 last summer augured the success for the implementation of the new payment regulations. However, in September 2019, the month in which the PSD2 was supposed to come into force, the Bank of Spain, the national payments market regulator, was forced to request an extension from the EBA to delay the implementation of the new regulations. The Spanish regulatory body, after carrying out a round of checks among banks and large businesses, realized that several important players were not yet ready. The banking sector presented two very different scenarios, the large Spanish banks were prepared to face the PSD2 thanks to their technological capacity and innovative spirit; the medium and small banks were not prepared for so much change due to the lack of technological manpower and little innovative vision.

The main problem for which the traditional banks were not prepared to offer PSD2 services and for which the moratorium had to be requested, is the delay in the development of the APIs. Traditional banks excuse themselves for the lack of technological capacity they have, however, TPPs accuse the banks of not developing the APIs as they should, as a way of preventing them from accessing customer data. TPPs, due to the malfunctioning of the dedicated interfaces, use the fall back mechanism, through which they can continue offering AIS and PIS services to their clients by means of the screen scraping technique. The fall back mechanism must be a temporary solution, and the mere fact that this solution exists is a powerful disincentive for banks to develop and improve their dedicated interfaces. TPPs prefer the use of long-term APIs even though at this time they get less information. The APIs will offer much more stable and economical services, they will stop depending on possible future changes to the banks' websites and will save on system updating costs.

This brief explanation of the current situation of the Spanish payment system serves to answer the main question of the research. The PSD2 has not been successfully implemented in the Spanish banking sector, due to the indifference of certain banks in correctly developing the dedicated interfaces to be able to offer quality services as required by the regulations. The Spanish Central Bank article warned that the lack of incentives for banks (ASPSP) to offer really effective and operationally reliable solutions through APIs could pose a problem in the future for the implementation of the PSD2. In addition, the article advanced the use of the fall back mechanism as a contingency measure in case the operation of the APIs does not meet the established requirements.

The arrival of the PSD2 has been a huge technological challenge for the banks, where they have had to invest a lot of economic and technological resources to be able to update themselves. Internal areas have been created solely to prepare for PSD2 and Open Banking, becoming one of the most powerful areas of the banks today. The banks that knew how to see the importance of Open Banking in its beginnings, are the ones that have the area dedicated exclusively to it and offer the PIS and AIS services through their APIs as if they were one more TPP. The banks that did not know how to see the arrival of Open Banking, go against the clock developing APIs that do not give the level. On the other hand, for Fintechs, PSD2 has also been a revolution, they have divided Fintechs into two different groups, the companies that operated before PSD2 and the companies that have been born based on the new advantages offered by PSD2. The Fintechs that operated before the PSD2 are the ones that have most noticed the impact of the new regulation, they are used to act without being regulated or supervised, accessing their clients' accounts through the Users Interfaces. Now, instead, the whole panorama changes, they must access their clients' data through APIs, which also do not offer the same quality or depth of data as web-scraping. The new Fintech companies, on the other hand, have not noticed the impact of PSD2, since they were created as a result of the new regulation, and have been accessing data through APIs from the beginning.

The relationship between banks and Fintechs is difficult to define, since they have a double relationship, the link can be competitive or collaborative depending on the way the actors act in each case. Competition is considered direct when both actors try to close an agreement with the same trade to offer PSD2 services. Competition will be indirect when Fintech provides technology to the neo-banks (N26 or Revolut) that are in direct competition with the traditional banks, since they are taking away a large share of customers. Technology should be an enabler that allows both banks and Fintechs to compete, but the real competition will be in the commercial agreements that each actor manages to close. The collaboration relationship is ideal for both parties, Fintechs can improve the payment services that the less technologically advanced banks provide, and in return they can increase their volume of clients, undoubtedly in this case it is a win to win relationship. Nevertheless, banks seeking to improve their payment services, instead of reaching a collaboration agreement with Fintech, as they have a large amount of economic resources, directly look for one of the most outstanding and successful Fintechs to acquire. In this way, traditional banks believe they have solved their technological problems in offering payment services, but by not knowing

how to integrate the Fintechs into the bank's internal organization, they end up destroying the life of the Fintech and the added value it was offering to the market.

The other big problem that exists in the relationship between traditional banks and Fintech is the data access process. Thanks to the PSD2, the TPPs accredited with the payment service licenses were supposed to have free access to the clients' financial data, always with the client's own authorization. One of the things that Spanish Fintech complains about is the power that banks have over the Bank of Spain, the regulatory body. The TPPs accuse the banks of slowing down and delaying as much as possible the process of obtaining licenses, which would be committing an infringement of unfair competition. In addition to this problem, the poor quality of the dedicated interfaces of some banks has led to a delay of 15 months in the implementation of the PSD2.

With this exposition of the impact that the PSD2 has had on the main players in the payments market, we respond to the first of the sub-questions raised by the research project. Furthermore, these findings reinforce the previous hypotheses raised in the analyzed article, where they predicted that the biggest challenge and limitation of the small Fintech companies acting as TPPs was the scarce client base they started with at the beginning, so they predicted that the collaborative relationship with the banks was the best way to grow. The other aspect in which this dissertation reinforces the study article is to corroborate what the Bank of Spain already advanced in its article. As banks are not limited in any way as providers of aggregation or initiation of payment services, they could enter the market to offer this type of service. The entry of banks into the payments market as TPPs tries to retain and build customer loyalty, but also to gain market share by trying to attract customers from other entities. The previous presentation also responds to the second sub-question raised in this research project, where the relationship between traditional banks and Fintechs acting as TPPs is discussed. In this case, the findings of this dissertation complete and fill a gap that the article of the Spanish Central Bank did not dare to predict, since it defined them as complex and difficult to anticipate.

The major finding of this research project has been to discover the current importance of customer financial information and data. The opening of bank customer data to TPP companies is one of the biggest revolutions that have taken place in the Spanish banking sector, it is a historical event, for the first time in history banks are forced to share their customer data with third party companies. The financial data of the users is the new gold, with all the information of the clients it is possible to offer a multitude of services as to profile better a client to offer better services or to do cross-selling and up-selling to offer complementary services to those that already had. Fintech no longer sees obtaining PSD2 licenses as a competitive advantage since it will become mainstream in a few years, the real value of the payment industry is no longer in the PSD2 licenses, but in the data you have. No one has ever had such depth on the financial behavior of both individuals and companies, not even the banks that had the banking information of their customer accounts, even if only from one bank. Today with the application of PSD2, the actors through AIS services have a 360-degree view of the data of all their clients' accounts even though they have them in different banks. There will come a day when some actor will be able to read, analyze and give

value to all this data in order to advise their clients on which financial decisions to take, how to improve financial behavior or how to make better operational flow decisions. This actor is assured of success, since he will have taken advantage of the great competitive advantage offered by Open Banking and will have offered the most complete and beneficial service for clients. Currently, taking advantage of account aggregation services (AIS) to snatch customers from the competition by offering them better financial conditions is a complicated and sensitive issue. Banks do not plan to exploit their customers' data in the short term, as they do not incur in data processing infringements regulated by the GDPR.

The big threat that has emerged as a result of the PSD2 is the entry of BigTech into the payments market. For the moment, the established players in the payments market do not pay much attention to it; they attribute their success to the fact that they are acting outside of regulation. The Fintech sector demands that the entry of BigTech should be regulated as it has been for all other participating players. Therefore, they ask the EBA to update the PSD2 to regulate all new agents offering payment services. The banks are clear that the moment Bigtech is regulated and has to comply with specific requirements and standards, it will lose interest in the payments market and possibly leave the sector. Even if they decide to stay, banks and Fintech have the previous experience in the financial sector as a competitive advantage over Bigtech.

The results of the questionnaire carried out to assess the knowledge and willingness to PSD2 and Open Banking of the users provide very enlightening data. Most users are happy with the services offered by their banks, and value positively their levels of communication and innovation. As a consequence, more and more users have accounts in more than one bank, while more than half of them admit that they do not manage their personal finances efficiently. For all of them, the account aggregation service could be very useful to improve the management of their accounts. The majority of users, despite valuing positively the communication between bank and customer, do not know anything about PSD2 and have only heard about Open Banking. Despite this, two out of three respondents are interested in learning more about PSD2 and opening data. The lack of security and data protection is the issue that generates the least confidence in the user. If the client were educated by their bank about the advantages and security that the implementation of PSD2 brings to all payments, they would increase the confidence of the users in the TPPs, therefore they would be more willing to open their data and would benefit from the multitude of payment services that Open Banking offers.

One of the main strengths of this research project is the novelty of the subject and the existence of few reports and articles written on the implementation of the PSD2 in Spain. The current status of this document is unique, it reports on the situation of the payments market and its main actors one year after the supposed implementation of the PSD2. Nonetheless, the great strength of this dissertation is the quality of the interviews. All the people interviewed hold important positions in Spanish banks and Fintechs, they work on a daily basis within the Spanish payments market and have experienced first-hand all the changes and delays that the PSD2 has been undergoing since its presentation in 2015 until its future and definitive application at the end of 2020. In addition, the topics discussed, and the questions

asked during the interviews have managed to obtain the necessary information and data to be able to offer a very precise vision of the current Spanish payments market. The biggest weakness of the project may be the questionnaire, it was addressed to individual customers, one of the main participants in the process of service payments AIS or PIS. However, the results have not reached the expected importance in the final discussion, probably because of the secondary role that the clients actually play. The only important decision they make is to accept or not that TPPs can access to their accounts. All other processes such as interaction between banks and Fintechs through APIs or Screen Scraping have no relevance.

The novelty and topicality of the main issue is one of the main limitations of the work, which is in turn one of its great strengths. The PSD2 being so current did not have much literature on which to base itself, most of the information that was available was academic articles and articles from digital and written press. In addition, the existence of research works at a postgraduate level were very scarce, most of those that have supported this project belonged to Scandinavian universities that are very advanced in Open Banking topics compared to Spain. On the other hand, the PSD2 as it is linked to the digitalization process of banks, is a subject in constant movement and change. The moratorium on payment services that delayed the implementation of the PSD2 until December 2020 obviously disrupted the main ideas of the project. In principle, it was wanted to have carried out the dissertation to check the impact on the main actors of the entry into force at 100% of the PSD2 in the Spanish payments market.

One of the objectives of the research is that the findings and experiences presented in this project will serve to understand a little better the current situation of the payments market, to learn about the new account aggregation services (AIS) and payment initiation services (PIS) and to better understand the actors involved in the payments process. The information discussed in this paper is valuable and varied so that the application of this work can serve all types of actors. To banks and Fintechs to establish their strengths and weaknesses and their competitors, to know the opinions of other actors or to discover new opportunities and threats. For clients, it can be useful to learn more about a subject such as Open Banking, which is currently revolutionizing banking services. Finally, it can be used by students who intend to carry out their research project on PSD2 or Open Banking.

Of the findings made with this dissertation, there are two that can be especially interesting topics for future research work. The first topic is the value of data, the Open Banking with the opening of data to third companies, has opened a new scenario that offers a huge variety of future services thanks to new techniques such as biometrics or artificial intelligence. Secondly, the other issue to be addressed may be the threat of Bigtech's entry into the payments market. These huge companies that focus their main activities on sectors completely different from the financial and banking sector have begun to offer PSD2 services if they are regulated. An interesting research project may be to monitor Bigtechs on whether they will eventually become a threat to banks if they manage to establish themselves in the payments market.

In conclusion, the PSD2 has not been correctly implemented in Spain yet, due to the lack of quality of the APIs developed by some banks. As a result, the Bank of Spain requested a

moratorium to make the PSD2 more flexible and to extend it for 15 months until December 2020. The banks have taken advantage of the benefits offered by the PSD2 and have acquired the licenses of account aggregation service provider (AIS) and payment initiation service provider (PIS), thus competing directly with Fintech. The access to data through the APIs has provided invaluable data, as it offers a complete view of the information of all the accounts of a client in all its banks. The player who succeeds in exploiting the real value of the data will have gained a crucial competitive advantage over the rest. The entry of Bigtech into the payments market, as long as EBA does not enter to regulate them as if they were TPPs. Finally, the client, despite still not having much knowledge about Open Banking, if the client is well educated by the banks about PSD2, they will have no problem sharing their data with TPPs to benefit from the PSD2 services.

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10. Appendix

• APPENDIX 1

MAIN REGULATORY CHARACTERISTICS OF STRONG CUSTOMER AUTHENTICATION UNDER THE PSD2

TABLE 2

Strong Customer Authentication under the PSD2			
Involves: authentication based on the use of two or more independent security elements	Security features:	<ul style="list-style-type: none"> – Knowledge (something only the user knows) – Possession (something only the user possesses) – Inherence (something the user is) 	
	Independent:	<ul style="list-style-type: none"> – The breach of one does not compromise the reliability of the others – No requirement for different devices 	
	Personalised security credentials:	Personalised security features provided by the payment service provider (PSP) or linked by the PSP to the customer	
Obligatory if:	<ul style="list-style-type: none"> – Online payment account access – Electronic payment transaction – Remote action entailing risk – Presence of a TPP 	Dynamic security feature if:	<ul style="list-style-type: none"> – Remote electronic payment transaction – Presence of a PISP
Possibility of exemptions based on:	<ul style="list-style-type: none"> – Level of risk (TRA) – Amount – Channel 		
Accompanied by:	Transaction monitoring mechanisms		

SOURCE: Banco de España.

- **APPENDIX 2**

Survey: Academic Research Investigation - Payment Service Directive (PSD2)

SURVEY PARTICIPANT INFORMATION

RESEARCH TITLE

Is the Payment Service Directive (PSD2) being successfully implemented in the Spanish banking sector?

You are being asked to participate in this survey as part of my MBA research dissertation, where our aim is to assess the degree of success of the PSD2 implementation in Spain.

I am Lucas Rivilla, an MBA student-focused in Financial Services (student ID: 10508705) at the Dublin Business School (DBS). Supervised by Philip Hickey, lecturer in Fintech, Finance, Innovation & Entrepreneurship at DBS.

The dissertation's mission is to assess the implementation of the Payment Service Directive (PSD2) into the Spanish banking sector.

WHAT WILL HAPPEN

In this study, you will be asked to answer 20 questions to measure the degree of client knowledge about PSD2 and Open Banking and to gauge their predisposition of the customers to benefit from the newly revised directive.

This survey is shareable via a link (for cascading), please feel free to share the survey for completion of other potential participants with at least one bank account with a Spanish bank. The survey is restricted to only 1 submission by participants.

The analysis of the survey results will provide insights into how bank customers interact with the new PSD2 and the Open Banking phenomenon. The results will be used for the research discussion of my MBA dissertation.

TIME COMMITMENT

The survey typically takes 5 minutes with a submission deadline on the 15th of August, 2020.

PARTICIPANTS' RIGHTS

You may decide to stop being a part of the research study at any time without an explanation required from you.

You have the right to ask that any data you have supplied to be withdrawn/destroyed. You have the right to omit or refuse to answer or respond to any question that is asked of you.

You have the right to have your questions about the procedures answered. If you have any questions as a result of reading this information sheet, you should ask me or my supervisor before the deadline (15/08/20).

CONFIDENTIALITY/ANONYMITY

The data I collect does not contain any personal information about you except your opinion and insights regarding the research topic, PSD2 / Open-Banking. The intentions regarding the data collected are just for use in my dissertation results and discussion. DBS Ethical Guidelines for Research with Human Participants have been followed for the development of this survey. An ethical review will be taken by the DBS once the dissertation is submitted (25/08/20).

FOR FURTHER INFORMATION

I will be glad to answer your questions about this study at any time (lucasrivillaoz@gmail.com). You may contact my supervisor at philip.hickey@dbs.ie.

Thank you in advance for taking the time to read the above. I will really appreciate it if you could volunteer to help and support me with this academic research investigation of PSD2.

*Required

DUBLIN BUSINESS SCHOOL - MBA IN FINANCE DISSERTATION SURVEY



QUESTIONS SHEET

Relationship Clients & Banks

Q1: In how many different credit institutions do you have a bank account?

Mark only one oval.

- I don't have bank account
 - 1 credit institution
 - 2 credit institutions
 - 3 credit institutions
 - 4 credit institutions
 - More than 5 credit institutions
 - Other:
-

Q2: Do you have the app for each bank downloaded into your smartphone or tablet?

Mark only one oval.

- Yes, I have downloaded the apps from all my banks.
 - No, I don't have all the apps downloaded. I only have the ones from the banks I use the most.
 - No, I don't have any app downloaded
 - Other:
-

Q3: How many times do you usually use the bank's app or log in through their website?

Mark only one oval.

- Several times daily.
- Maximum once a day.
- 2 three times a week.
- Less than once a week.
- Other:

Q4: In which situations do you usually use the app?

Mark only one oval.

- Online Payments
- Money Transfers to friends or family
- Check the Account Balance
- Check and manage your specific expenses
- All the above
- Other:

Q5: How would you rate the services offered by your banks?

Mark only one oval.

- Poor
- Deficient
- Good
- Very Good
- Excellent

Q6: How effective do you think is your banks' communication with its clients?

Mark only one oval.

- Poor
- Deficient
- Good
- Very Efficient
- Excellent

Q7: How innovative do you think are financial services offered by your banks' app?

Mark only one oval.

- Poor
- Deficient
- Good
- Very Innovative
- Excellent

Q8: Do you think you manage your personal finances in the most effective and cost-efficient way on your own?

Mark only one oval.

- Yes, I take care of my finances effectively
 - No, I should improve my finances management
 - No, I do not care much about my finances
 - Other:
-

Q10: If you are not using an independent app to manage your personal accounts and finances yet, would you be interested in starting to use one of these apps?

Mark only one oval.

- I'm already using these applications.
- Yes, I'm very interested in starting to use them.
- Yes, I never thought about it before, but I might start using those apps.
- No, I'm not interested in those apps, I'm satisfied with the services offered by my own banks.
- Other: _____

Q11: If you are not willing to use these apps, what reasons would you have for not using the new Fintechs to manage personal finance?
(Multiple Choice)

Tick all that apply.

- The lack of Experience of Fintech companies
- The lack of Confidence in Fintech companies
- The lack of Security of Fintech companies
- Satisfied with the services offered by my banks
- Not interested in Fintech companies

Other: _____

PSD2 & Open-Banking

Q12: Do you have any idea about the Payment Service Directive 2 (PSD2)?

Mark only one oval.

- Yes, I am aware of the functions, implications and advantages of PSD2.
- Maybe, I've heard of PSD2 and the but I don't really know what it consists of.
- No, I don't have any idea about the PSD2.
- Other: _____

Q13: Have you heard of Open Banking before?

Mark only one oval.

- Yes, I am aware of the functions, implications and advantages of Open Banking.
- Maybe, I've Maybe, I've heard of Open Banking and the but I don't really know what it consists of.
- No, I don't have any idea about the Open Banking.
- Other: _____

Q14: Would you be interested in having more information about the new Payment Service Directive (PSD2) and Open Banking?

Mark only one oval.

- Yes, I am interested.
- No, I am not interested.

Q15: Which of these advantages offered by the online payment service apps seem most important to you? (Multiple Choice)

Tick all that apply.

- Greater transparency and information
- Faculty of cancellation of any operation without previous consent
- Limitation of responsibility in case of being a victim of fraudulent operations
- Reducing fraud and increasing bank security
-
-
- _____

Rectification of unauthorized operations

All of the above

Other:

Q16: One of the features of PSD2 is the authorized opening of clients' personal financial data to third party companies (Fintechs). Would you be willing to share your personal data with Fintechs specialized in accounts management?

Mark only one oval.

- Yes, I would be willing to share my personal data in return for receiving a quality service from the Fintechs
- Maybe, I would have to be informed of the implications of sharing my personal information
- No, I would prefer the bank just to have my financial information

Q17: The PSD2 offers 2 specific payment services: Account Information Service (allow us to have a global vision of the different accounts that we have opened in several banks from a single platform) and Payment Initiation Service (allow us to pay by Internet without needing to use any payment method such as a credit card or bank account). In which payment services would you be interested in?

Mark only one oval.

- Account Information Service
- Payment Initiation Service
- Both services I
- am not
- interested

Other:

Demographic Questions

Q18: Age: What is your age?

Mark only one oval.

- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75 years or older

Q19: What is your gender?

Mark only one oval.

- Male
- Female

Q20: Employment Status: Are you currently...?

Mark only one oval.

- Student
- Self-employed
- Junior
- Associate
- Manager
- Senior
- Head of department
- Unemployed
- Retired
- Unable to work
- Other:

. Q21: Where are you from? (Specify the country)

THANKS, A MILLION FOR PARTICIPATING IN THIS SURVEY!

By the submission of your survey answers, you are agreeing that: (1) you have read and understood the Participant Information, (2) questions about your participation in this study have been answered satisfactorily, (3) you are aware of the potential risks (if any), and (4) you are taking part in this research study voluntarily (without coercion).

This content is neither created nor endorsed by Google.

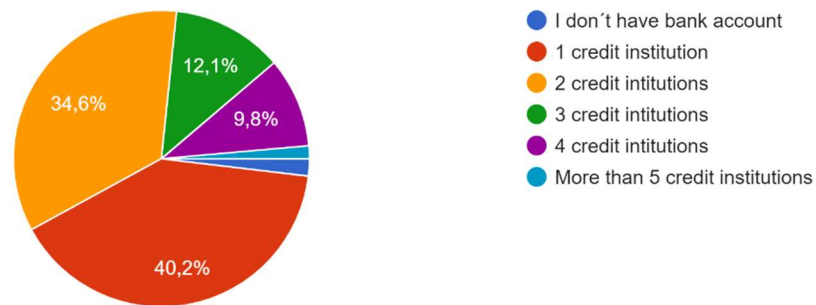
Google Forms

RESPONSES SHEET

Relationship Clients & Banks

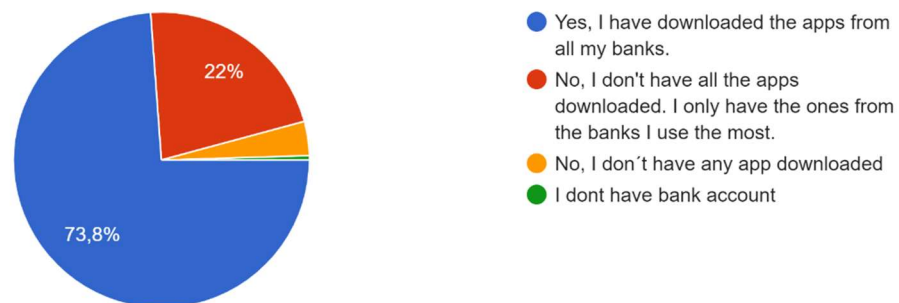
Q1: In how many different credit institutions do you have a bank account?

214 respuestas



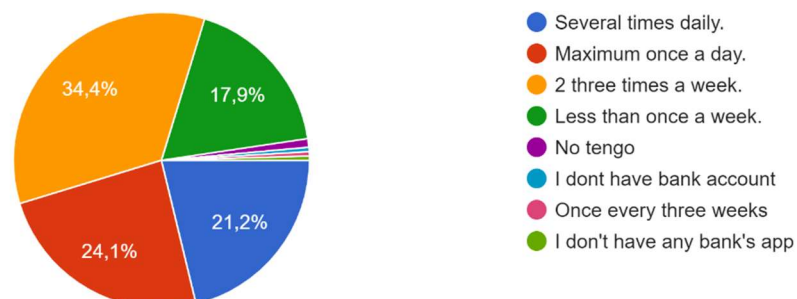
Q2: Do you have the app for each bank downloaded into your smartphone or tablet?

214 respuestas



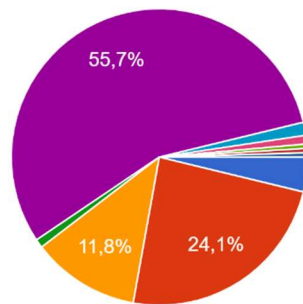
Q3: How many times do you usually use the bank's app or log in through their website?

212 respuestas



Q4: In which situations do you usually use the app?

212 respuestas

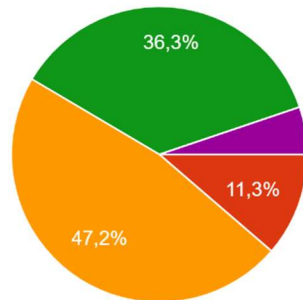


- Online Payments
- Money Transfers to friends or family
- Check the Account Balance
- Check and manage your specific expenses
- All the above
- Question should give multiple options
- Nunca
- I don't have bank account

▲ 1/2 ▼

Q5: How would you rate the services offered by your banks?

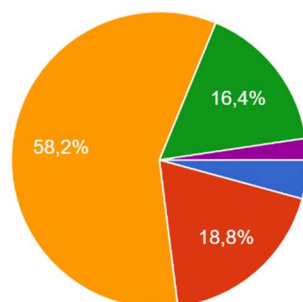
212 respuestas



- Poor
- Deficient
- Good
- Very Good
- Excellent

Q6: How effective do you think is your banks' communication with its clients?

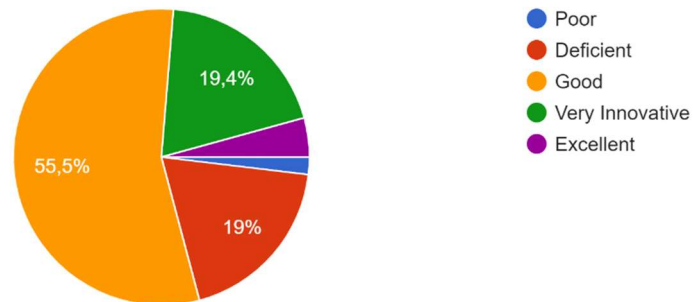
213 respuestas



- Poor
- Deficient
- Good
- Very Efficient
- Excellent

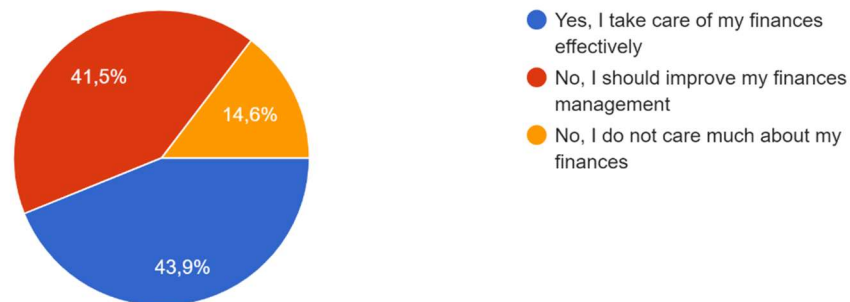
Q7: How innovative do you think are financial services offered by your banks' app?

211 respuestas



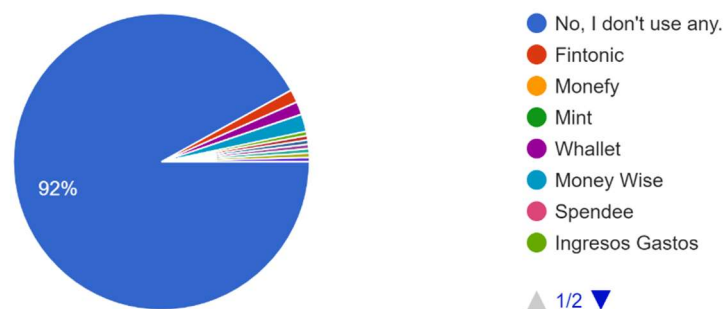
Q8: Do you think you manage your personal finances in the most effective and cost-efficient way on your own?

212 respuestas



Q9: Do you use an independent app that manages your bank accounts and personal finances? Which one? (In case it does not appear in the below options, please indicate which one you use)

212 respuestas



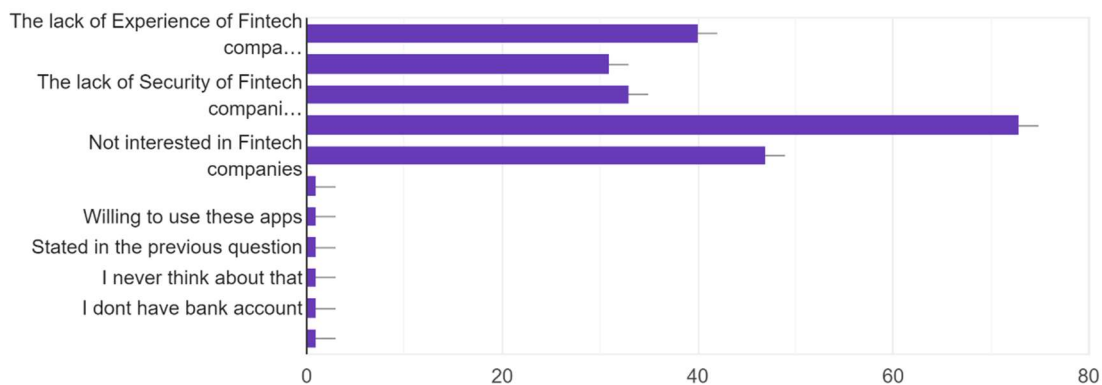
Q10: If you are not using an independent app to manage your personal accounts and finances yet, would you be interested in starting to use one of these apps?

210 respuestas



Q11: If you are not willing to use these apps, what reasons would you have for not using the new Fintechs to manage personal finance? (Multiple Choice)

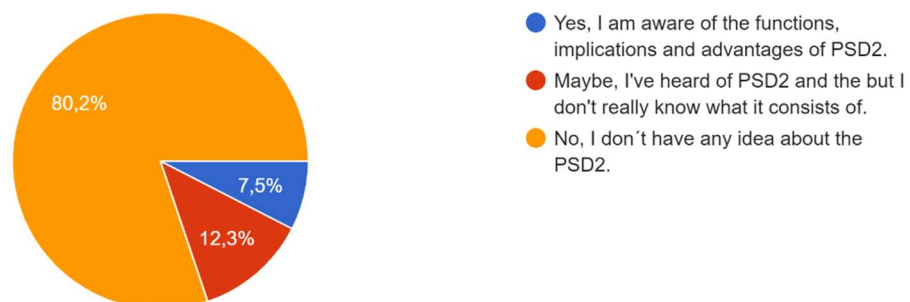
179 respuestas



PSD2 & Open-Banking

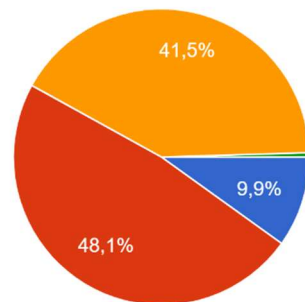
Q12: Do you have any idea about the Payment Service Directive 2 (PSD2)?

212 respuestas



Q13: Have you heard of Open Banking before?

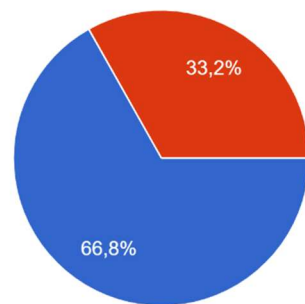
212 respuestas



- Yes, I am aware of the functions, implications and advantages of Open Banking.
- Maybe, I've heard of Open Banking and the but I don't really know what it consists of.
- No, I don't have any idea about the Open Banking.
- Yes

Q14: Would you be interested in having more information about the new Payment Service Directive (PSD2) and Open Banking?

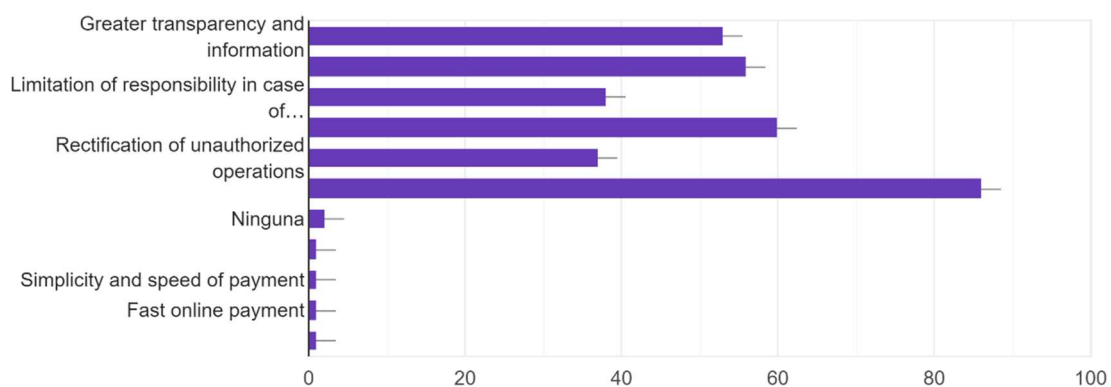
211 respuestas



- Yes, I am interested.
- No, I am not interested.

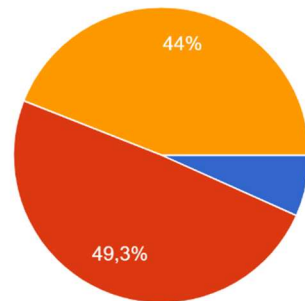
Q15: Which of these advantages offered by the online payment service apps seem most important to you? (Multiple Choice)

207 respuestas



Q16: One of the features of PSD2 is the authorized opening of clients' personal financial data to third party companies (Fintechs). Would you be wi...th Fintechs specialized in accounts management?

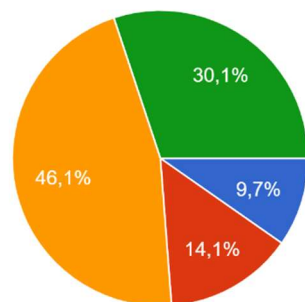
209 respuestas



- Yes, I would be willing to share my personal data in return for receiving a quality service from the Fintechs
- Maybe, I would have to be informed of the implications of sharing my personal information
- No, I would prefer the bank just to have my financial information

Q17: The PSD2 offers 2 specific payment services: Account Information Service (allow us to have a global vision of the different accounts that we ha...hich payment services would you be interested in?

206 respuestas

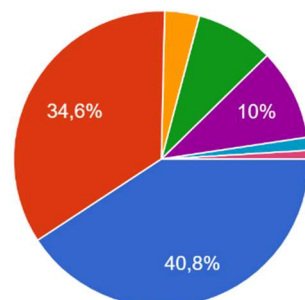


- Account Information Service
- Payment Initiation Service
- Both services
- I am not interested

Demographic Questions

Q18: Age: What is your age?

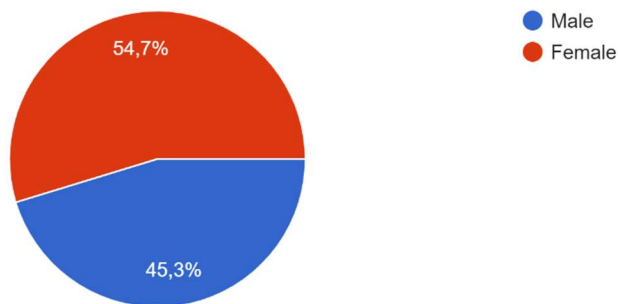
211 respuestas



- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75 years or older

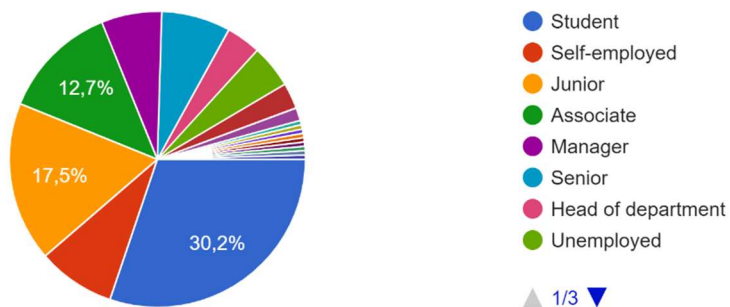
Q19: What is your gender?

212 respuestas



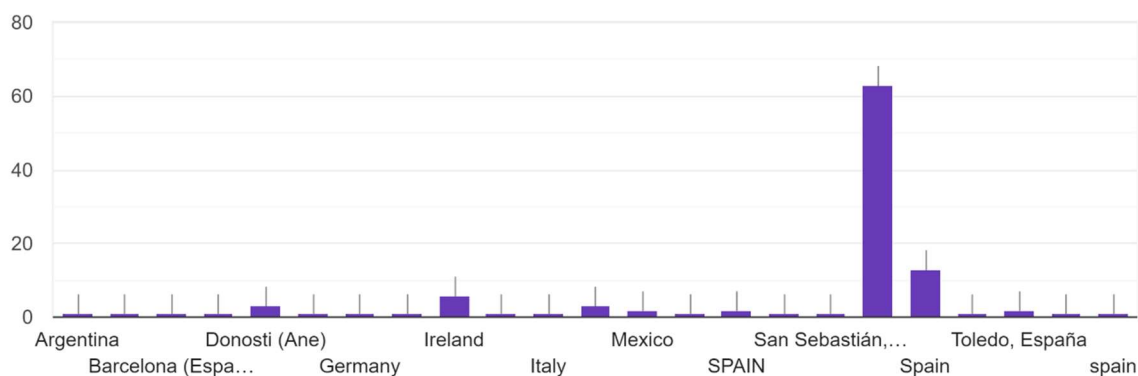
Q20: Employment Status: Are you currently...?

212 respuestas



Q21: Where are you from? (Specify the country)

109 respuestas



- **APPENDIX 3**

PROPOSED INTERVIEW QUESTIONS

1. What was the main activity of the organization before the implementation of PSD2?
2. How has the organization changed its business activities in payment services matters with implementation of the PSD2?
3. What kind of advantages has the opening of data of the PSD2 offered to the banks/new Fintechs? What challenges have the bank/Fintechs face?
4. How is the relationship with the banks/Fintech? Is there a healthy competition with the banks? Can it refuse to share the data with TPPS?
5. Can a relationship of convenience between a bank and TPPS be beneficial for both? Are the bank/new Fintech products a threat to banks/Fintechs in relation to payment services? Which kind of product do you offer?
6. How is your relationship with the clients/users? How do you get costumers? Are your costumers' corporations and individuals?
7. How do you monetize its services? How does the organization earn incomes?
8. What added value does the organization offer compering with the TPPS competition? Who are your closest competitors, apart from the banks?
9. Which agent has been more favored? What about the entrance of the Bigtech to the payment service sector?
10. Is Spain an advanced country in terms of Open Banking compared to Europe?
11. Future of Open Banking: Will be a new PSD3 soon? It is necessary to be a new PSD3 soon?
12. Has the COVID-19 influenced the development of PSD2 for better or worse?