

**UNIVERSITAT
JAUME·I**

DEGREE IN FINANCE AND ACCOUNTING

YEAR: 2019 – 2020

**EVOLUTION OF TRADITIONAL BANKS: FINTECH AND BIGTECH AS THE FUTURE
OF FINANCE.**

STUDENT: NOELIA ALTABA TENA (al340747@uji.es)

TUTOR: NURIA ALEMANY PALOMO

EVOLUTION OF TRADITIONAL BANKS: FINTECH AND BIGTECH AS THE FUTURE OF FINANCE.

INDEX

1. Introduction.....	8
2. Traditional banks.	9
2.1. Employees and branch offices.....	10
2.2. Negative interest rates.....	13
2.3. ROE and COE in Europe.....	14
3. Fintech.....	16
3.1. Fintech, new concept.....	16
3.2. Fintech's investment in Europe and Spain.	17
3.3. Neobanks/Challenger banks.....	21
3.3.1. Contrasting new banks with traditional banks.	22
3.3.2. Examples of this category.....	22
4. Bigtech.	25
4.1. GAFA (Google, Apple, Facebook, Amazon).....	27
5. How banks are managing the new banking landscape.....	30
5.1. Digitalization.	32
5.2. Collaboration with traditional banks.	34
6. Regulation.	36
6.1. Sandbox regulation.....	37
7. Conclusion.....	38
8. Webgraphy.	39
9. Bibliography.....	42

Index of graphics, tables and figures.

Graphic 1 - Number of employees.	11
Graphic 2 - Number of branches.	12
Graphic 3 - Evolution of Euribor.	14
Graphic 4 - ROE and COE in Europe.....	15
Graphic 5 - Total investment activity in fintech in Europe.	18
Graphic 6 - Investment from VC in Europe, Asia and USA.....	19
Graphic 7 - Spanish knowledge about fintech.	20
Graphic 8 - Age and place of the fintech in Spain.	21
Graphic 9 - Total number of customers in challenger banks.....	24
Graphic 10 - Bigtech’s revenues by sector of activity.	26
Graphic 11 - Spanish technological usage in financial services.....	33
Graphic 12 - Number of financial services over time.....	35
Table 1 - Main fintech innovations.....	16
Table 2 - Main bigtech innovations.....	30
Figure 1 - All financial services offered by Amazon.	28

ABSTRACT

The objective of this document is to analyse the reason why traditional banks are losing ground and how they are adapting at present technological needs. In so doing, we will show the difficulties banks face on account of two main factors, namely: the huge operating costs and few profits but also challenges for the new competitors coming from the new technological advances.

In addition, an overview of the new era of competitors that have appeared due to the technological evolution will be explained: fintech, financial companies, with a new version of online banks and bigtech, companies that take advantage of the worldwide market and their great number of customers. It will be shown how they mainly work but also their limitations regarding to the regulation.

KEYWORDS: traditional banks, digitalization, innovation, fintech, bigtech

1. Introduction.

Banking is experiencing necessary changes to improve its service so that potential customers would still prefer the personal service of traditional banks instead of online-only banking options that are growing exponentially. The fact that companies, which are not specialised in banking, can offer the same services that banks, have turned upside down the banking sector.

The entrepreneur Bill Gates already predicted in 1994 that technology would transform the banking landscape. His widely known quote "*Banking is necessary; banks are not*" is now more present than ever, up to a point in which a question arises between experts in the field: Are new entrants a threat or an opportunity for banks?

A significant moment considered as an inflexion point in the banking sector was the financial crisis occurred in 2008 that evidenced bank's fragility. Not only did banks lose the customer's confidence but they also faced another fragility through years: the lack of modernization regarding to the technological resources that were arising. From that moment onwards, more and more financial start-ups starting to emerge, taking advantage of the new scenario, and optimizing their costs avoiding expenses such as having physical branches or too many workers, offering instead a 100% online service with lower fees. Many people think that we are entering a new era, the "*fourth industrial revolution*", especially focused on millennials and centennials, where technologies based on Big Data, Artificial Intelligence and the Internet of Things among others blur the barriers between the physical and the digital (González-Páramo, 2017).

This project analyses why traditional banks are losing ground and what are they doing to survive while reinventing themselves. To this end, we first examine the traditional banks evolution regarding internal costs (the costs that were necessary in the past, but not now), then we have a look at the negative interest rates that make their own funds inefficient.

Second, we study who are the new competitors for traditional banks. On one hand, fintech are described, which have become a revolutionary way of managing the money according to the needs of the customers. Their usage and investment have been dramatically increasing during the last years in parallel with the rise in mobile usage of smartphones and apps. In particular, we examine what neobanks and challenger banks are and how they are changing the financial landscape, particularly, we talk about Monzo, Revolut, N26, Starling Bank and Bnext.

Third, we focus on another competitor, different from fintech but also associated with the technological progress: the bigtech, specially Google, Apple, Facebook and Amazon, widely known as GAFAs. These companies are bigger than Fintech, but they are not 100% specialised in finance.

Fourth, we uncover how banks face to these challenges and what actions they have carried out in order not to lose competitiveness. Particularly, we focus on the top four banks in Spain: Santander, BBVA, Caixabank and Sabadell.

Finally, we revise the new regulation required to cover all needs guaranteeing economic and personal safety in businesses, keeping in mind that regulation is not equal in the whole world. We also study the regulation existing for those projects that are too new and cannot be regulated as the others.

What the future holds for banks beyond 2020 is unknown, but most experts conclude that the best solution for traditional banks to survive and increase competitiveness is to collaborate and learn from these new innovative financial companies, as suggest by De la Mano and Padilla (2018, page 9), banks can choose between having less control of their own company but collaborating with new techs, or not to collaborate and stay traditional. Rather than fearing the challenges these new entrants bring, banks should embrace them as an opportunity to deliver value-adding financial services.

2. Traditional banks.

Thanks to the technology, there has been a revolution in innovations of every daily action people do. Banks have experienced these improvements too. However, they still face some inconveniences that make them persist in the traditional methods of banking that finally might make them less efficient.

There are some parts of their internal environment that banks have to deal with in order to achieve a high performance by reducing excessive costs, as well as digitalize the banking system, while guaranteeing their traditional service.

In this section, we revise the great diversity of clients due to their different age and the knowledge about technology; business costs, traditional and significant for the company and the way banks finance themselves regarding to interest and Euribor rates, and profitability of their equity in the indication of ROE and COE. What banks finally face is a need of digitalization that allows them to compete in a world full of innovative tools.

It is known that traditional banks are those based on the exchange of financial products with their customers. The most common products offered could be understood as

withdrawing and depositing money in the personal account, borrowing an amount of money through loans, offer some insurance, making savings profitable, meaning the fact of obtaining a benefit from having an amount of money in the bank during a period established. An example could be a pension plan or an investment fund. The advantage that a customer obtains from doing this type of transactions with a traditional bank is the safety that a face-to-face service offers which makes easier to solve doubts for customers, and it is more difficult to find in the new banks.

In addition, population (especially the oldest ones) usually prefer firstly to guarantee their money even though the profits obtained are not as large as they could be if they were invested/borrowed in non-financial institutions, and moreover, Spain is a country which paper money is not only required but also the most used way of paying (Ruiz and Castilla, 2016).

Furthermore, as Jiménez and Tejero (2018) claim, the common way of paying in Europe (with a 79% of the operations done at the end of 2017) in every shop used to be by cash and particularly in Spain, people use it more than the European's average.

Nevertheless, at present banks have to deal with costs that comes from investing in huge staff due to many branches. Those branches were actually needed years ago because there was no way of doing transactions but going, physically, to the bank so that an agent would manage the money. Nowadays, thanks to technology, simple transactions are easily done by an ordinary customer of a bank. The problem seems to appear for those not used to technologies. It is assumed by banks that "everybody" might know how to do, for example, a transfer on the phone. The real fact is that there is a big amount of people which cannot do these transactions by themselves. Once they are in the bank, they are forced to pay a banking fee for the easiest transaction since it is understood that everyone can do it online.

Even though the trend is through online transactions, what leads to the closure of banking offices, there are part of the citizens that cannot be excluded, such as the elder people. Some banks try to solve this situation. For example, Caja Rural of Teruel chose proximity banking focusing on the population (whose vast majority were farmers) that let the company grew in their first years even if it meant lower the profits of the bank (Sereno, 2020).

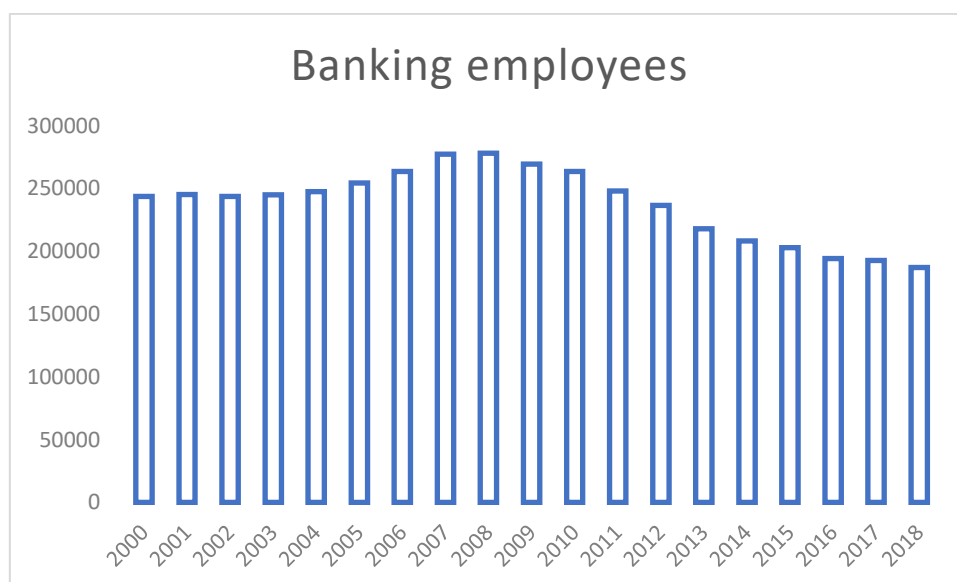
2.1. Employees and branch offices.

The evolution of banking due to the introduction of technological developments call into a question: are being well distributed operating cost between keeping traditional and

investing in the future? As Domínguez (2019, page 7) claims: “There is a clear conflict of objectives between the requirement of reducing costs and the challenge of financial inclusion”. This inclusion is understood as the capability of introducing new financial tools to satisfy new needs for both the customers and for the employees. Given these innovations, banks can increase their efficiency reducing some internal costs considered inefficient.

In an overall context where benefits from their daily transactions are difficultly obtained, the closure of the bank offices, as well as the fact of increasing the use of online services, may be considered as a starting point in order to reduce fixed costs. The following graphics shows the evolution in terms of employees and in the number of branches in Spain:

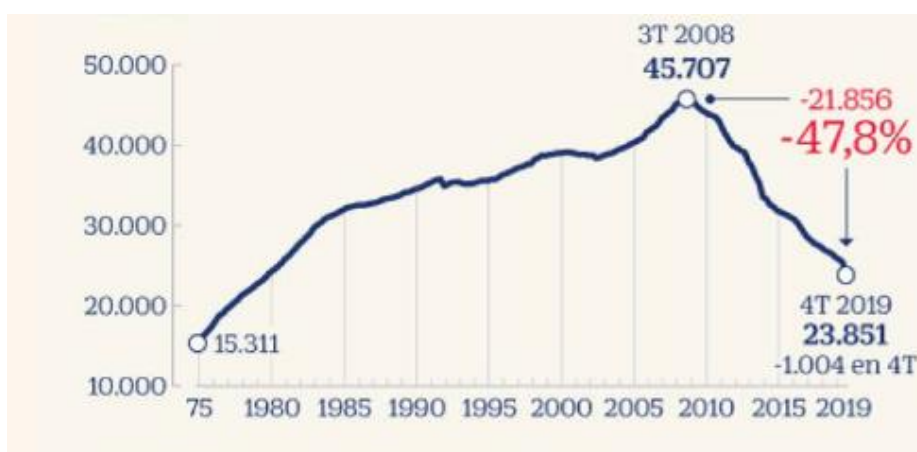
Graphic 1 - Number of employees.



Source: Banco de España:

<https://www.bde.es/webbde/en/estadis/infoest/bolest4.html#> available at 4.46 number of employees.

Graphic 2 - Number of branches.



Source: Cinco Días.

As can be observed in both charts, from 2000 to 2019 the number of employees remains similar until 2005 whereas there was a decrease in the number of branches (BCE 2017, page 31) due to the crisis of technological companies that finished at the end of 2003.

The period that follows this one is associated to the real estate boom which as well as in all labour market, resulted in an increase of the number of employees and also offices that reached the highest point between 2007-2008. What basically happened at that time was that people influenced by an overestimated view of a huge future income, started to get into mortgage debt, loans, to buy flats, houses, cars...all type of luxuries that were beyond their financial possibilities. However, this caused significant problems since the economy debt was constantly increasing and also the housing sector was facing weaknesses coming from the overvalued house pricing. This was called the housing bubble¹. This point is shown in the graphic since the number of employees decrease from 278.301 in 2008 to 269.682 in 2009. From that moment until now, it has been decreasing year by year. So do the number of entities closed: in the last six years the number of entities closed have been 11.387. These numbers mostly come from big entities such as Santander and Caixabank trying to save money in order to be more efficient.

Taking the average of these numbers, in terms of employees from 2008 until 2019 the decrease has been of 47,8% which is a significant number in only 11 years. Nevertheless, if that percentage is huge, in the coming years is not planned to stop in order to arrive to the European's average. As pointed by Bermejo (2019), within Europe

¹ A housing bubble, or real estate bubble, is when houses' price increase quickly because of a huge demand, in most cases due to speculation.

there is one office every 2278 residents, in Spain it is every 1694 citizen which is a relevant number, meaning that every office should assist almost 584 more customers to be as efficient as the average. This argument is supported by Zuloaga (2020) showing that apart from Spain, by the end of 2018 there was only one country with more entities per person in Europe and in terms of employees, since the crisis there has been a destruction of more than 100.000 jobs (which means a decrease of 35% since 2008).

What the statistics show is that the number of physical offices has decreased quicker than the number of employees, which means that the banks have kept their personal assistance to their customers. Particularly in Spain, there are many villages with few habitants. They are the ones facing the closure of these physical offices because of the few profits they offer. It is given special emphasis to this fact since this population, who lives in villages usually are the elder ones who do not have access to online platforms. Consequently, this closure makes the population either to move to another village to dispose their money or finding an alternative option. The alternative usually offered by banks, understanding that maybe not everyone can easily move, is called "ofibus", a bus that recreates what it could be an office and which goes village by village, and there are also financial agents who even without a physical office, they go to the villages and offer a personalised service.

The graphics depict there has been a constant decrease in workers and entities since 2009. Maybe the crisis is not the main cause of the decrease in the last years as it was in the years after 2008. By contrast, the latest decreases could be better associated with the arrival of new technologies rather than the financial crisis.

2.2. Negative interest rates.

Traditionally, banks have been able to assume most of their usual expenses with the profits from the interest rates, which is a profit obtained for lending money to customers.

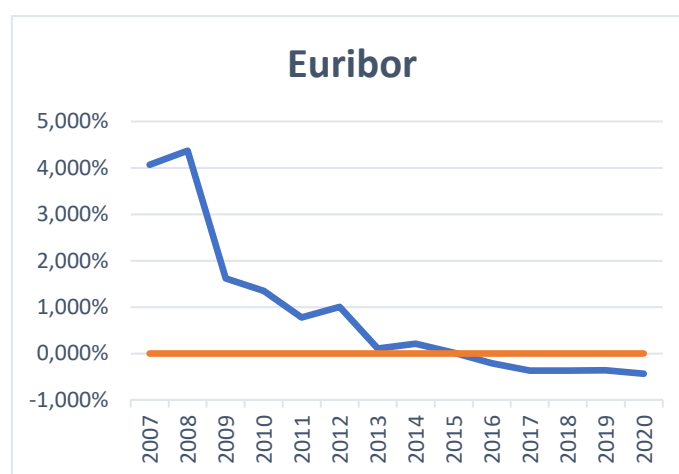
However, from several years, there has been negative responses about interests and the real fact is that since 2014, when the interest rate dropped below 0%, the amount has not varied noticeable. This happened because the European Central Bank was forced to reduce the interest to let banks offer loans at low price achievable for customers, what would make the cash flows.

In this sense, banks are cautious and are not willing to assume the risks as it happened before the crisis, when many people could not afford to pay the loans falling into default. On the other hand, many customers are not willing to run the risk again and try not to frequent banks. The consequence is a negative interest rate, that is an Euribor (which is

the interest rate of exchanging money between banks), remaining in negative territory since banks might not need to exchange as money as years ago.

Euribor is also an identifying of most mortgages' monthly payments which at the same time, is the main source of income for banking. The following chart show the evolution of the Euribor in years. If Euribor is below zero, the benefits from lending money are minimum because they fully depend on the fixed tax (normally the price for lending money is the percentage of the Euribor plus a fixed tax). Banks face difficulties talking about profits from their interest rates:

Graphic 3 - Evolution of Euribor.



Source: Own elaboration from Euribor Rates, available at <https://www.euribor-rates.eu/en/euribor-charts/>

In addition to these two inconveniences regarding to bank's profits, Economía 3 (2020) explains that the importance of profits for banks lies in the fact that given few profits, they cannot develop a capital buffer in case it is needed in the future which as a consequence, it would contribute negatively to the financial stability.

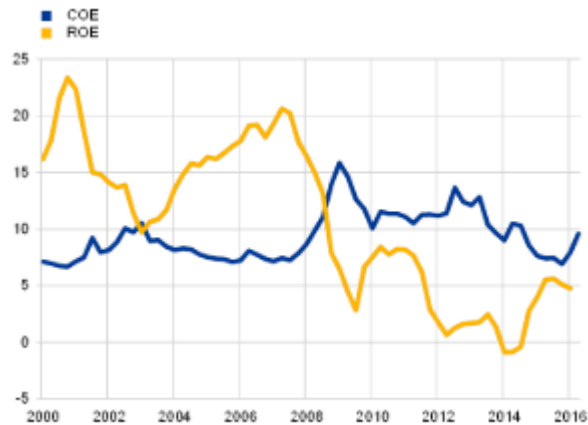
Those three inconveniences regarding to bank's profits have a negative consequence for customers too. Unfortunately for them, nowadays an alternative for the bank in terms of obtaining profits or reduce costs is the rise of banking fees. The customers that most suffer these fees are those whose incomes are lower or whose accounts have fewer movements or usage.

2.3. ROE and COE in Europe.

ROE (Return On Equity) and COE (Cost of Equity) are two indexes that regulate the bank's profitability: the first one explains the net profitability obtained from shareholders equity while the second one explains how much it costs for the banks to obtain this

shareholders equity as well as the risk that the bank assumes for having on their position those assets.

Graphic 4 - ROE and COE in Europe.



Source: Extracted from European Central Bank.

This plot shows how difficultly has been for banks to recover the benefit obtained before the financial crisis, where the ROE was bigger than the COE, which meant that there were big profits. The turning point takes place in the middle of 2008. From this point onwards, the common situation that banks faced was that people could not pay, which resulted in a default of the payments of their mortgages. This means that before the crisis, banks were willing to take more risks since they wanted to obtain huge profits. However, after the crisis, when the Euribor value dropped, its consequences for banks were that all the money that they have lent and was expected to take back with high interests, was going to provide them zero/ few profits or in the worst scenario, result in default.

The results obtained can be seen in the documents of ECB in 2018 where the ROE in the Eurozone is about 6% and the COE between 8-10% (De Guindos, 2019). Thus, the significance of these percentages anticipates that the funds which were causing benefits before 2008, were generating a cost after that year. This low profitability worries banks since it makes more difficult to assume in the future a possible economic deceleration and compete with the new entrants.

3. Fintech.

The increasing usage of Internet and the development in the financial companies have generated new competitors for traditional banks that are able to do the same activities with less costs.

3.1. Fintech, new concept.

The term fintech refers to the technological innovations in the financial services industry. Thus, before the explanation of these innovations it is important to understand its background and history. Some fintech took off after the financial crisis of 2008. The financial crisis made customers lose their trust in banking institutions due to several reasons. First of all, the lack of transparency played a big role in this process. Moreover, banks had to deny many requests that aimed to stimulate investments or any financial help. It was obvious that the renovation of financial services industry was necessary in order to satisfy the customer needs again. The newly emerging customer's needs also include the facilitation of managing bank-related activities, since the accessibility of offices is limited due to opening hours, waiting time or distance. Furthermore, the convenience of running errands from home is appealing to everyone. Fintech is not only able to give a solution to the above-mentioned problems, but also attracts its users with further innovations.

Although the fintech start-up companies are not coming from an innovation from the banks, but it is a new concept introduced by those talented young graduates and professionals who realized how badly the financial services industry treated many of its customers, and seized the opportunity to create something revolutionary.

The main fintech innovations can be categorized in the below table, according to a report issued by The Reserve Bank of India (2017).

Table 1 - Main fintech innovations.

Payments, Clearing & Settlement	Deposits, Lending & capital raising	Market provisioning	Investment management	Data Analytics & Risk Management
Mobile and web-based payments Digital currencies Distributed ledger	Crowd-funding Peer to peer lending Digital currencies Distributed Ledger	Smart contracts Cloud computing e-Aggregators	Robo advice Smart contracts e-Trading	Big data Artificial Intelligence & Robotics

Source: Reserve Bank of India.

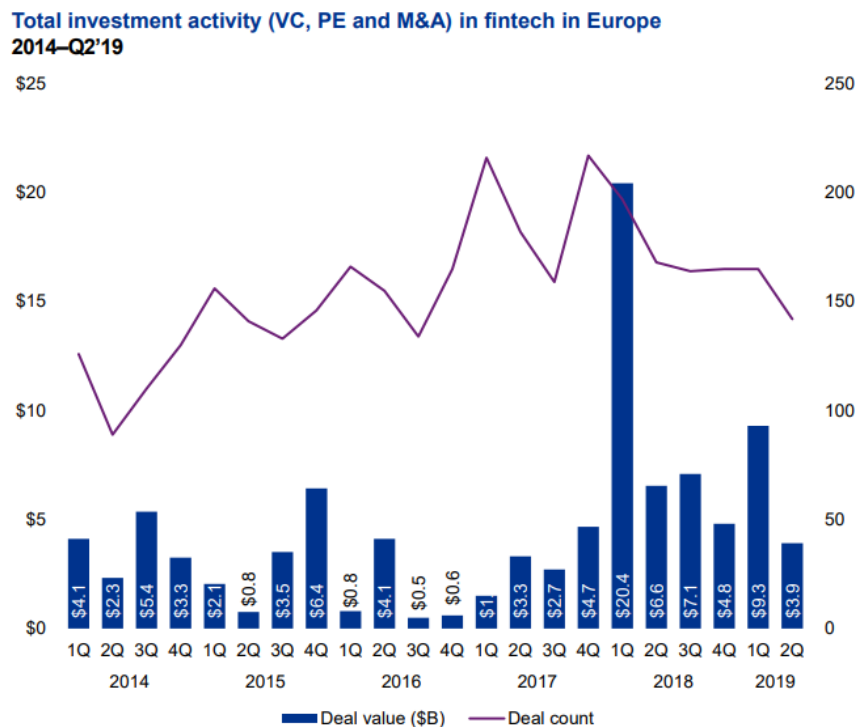
Financial Technology are becoming a growing component of the finance sector as the overall economy becomes digitalised. Broadly categorised into 5 different categories, fintech innovates the existing technologies and invents new supplementary technologies and companies. Fintech innovations take place over the entire financial sector from payments and deposits to investment and managing risk. Financial Technology aims to improve efficiency and accessibility of financial products and services in line with contemporary consumer demands. The change in demands can be seen across the wider economy as consumer behaviours and interests change with technology. A good example could be the growing value of e-commerce and the diminishing value of the high-street. With this in mind, there is a growing demand for consumers who wish to handle their finance online as opposed to spending what could be considered unnecessary time and resources going to the bank to solve an identical issue.

The innovation of mobile and web-based applications creates an infrastructure where a consumer mobile acts as their credit/debit card creating efficiency while alleviating the need for the physical card. Additionally, digital currencies can be said to have a similar effect of replacing physical currency. However, digital currencies can be used to highlight the new issues created by financial technology generally surrounding regulation and security. Conversely to these innovations, the ones causing more controversy are cryptocurrencies. Even if they considered legal tender, they are not sovereign to any nation and are usually traded across borders and therefore, deciding who is responsible for the regulating of such currencies is challenging. Finally, cryptocurrencies can be sent anonymously and sending private data over the internet always should be handled with care. This is a key issue as they can be made by any unlicensed party.

3.2. Fintech's investment in Europe and Spain.

One way of understanding the increasing interest in fintech is by looking at the financial resources invested by financial and non-financial institutions (see graphic 6).

Graphic 5 - Total investment activity in fintech in Europe.



Source: <https://assets.kpmg/content/dam/kpmg/xx/pdf/2019/07/pulse-of-fintech-h1-2019.pdf>

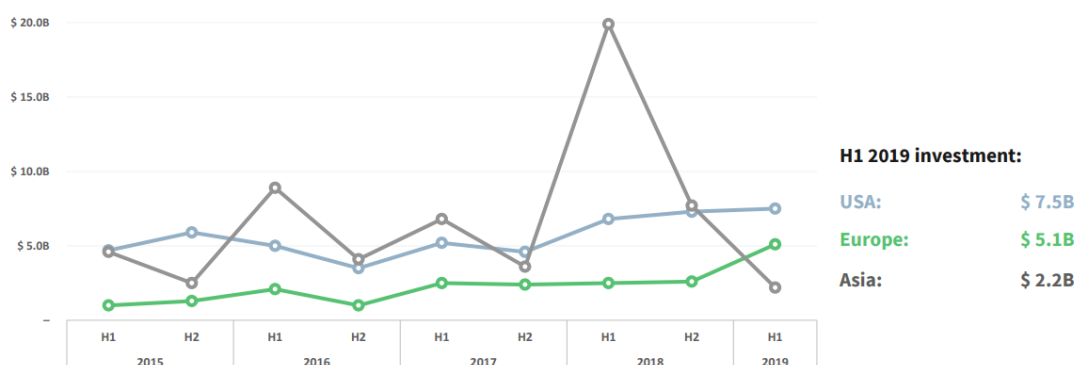
The previous chart depicts the major part of the money invested in fintech that comes from different deals made between companies. Those entities used to be more traditional and stable and they need to take profit of their earnings. They invest their money in fintech's companies, which need a monetary support to be more powerful and innovative. The deals come from:

1. Venture Capital (VC): It is a model of investing where the investors diversify their money between different start-ups. Thus, while the investor guarantees some profits if the start-up achieves a better position, the owners of the fintech have more available funds.
2. Mergers and Acquisitions (M&A): this method is useful for example if a traditional company wants to diversify and modernise its services partnering with a start-up. Both take profits of it because the start-up acquires funds.
3. Private Equity (PE): this is another way of financing a fintech, similar to the VC. However, while VC is more focused on the companies at the beginning of their production system, PE tries to finance more mature/ consolidated fintechs that might need as well funds.

The interest rise in fintech is a real fact. Indeed, the total amount invested in the first half of 2014 was \$6.4 billion while in the first half of 2019, the amount was about \$13.2 billion which is a considerable increase of more than double resources available in only five years.

On the other hand, in the following chart, it is seen the VC investment in different parts of the world. This is a comparison of VC done in the last years in the most competitive parts and it could reflect the number of new fintech coming from these deals. Focusing on Europe, it is reflected that even if during the first part of 2019 Europe is positioned as the second in VC investment, before Asia and after USA, it is important not to forget the huge increase rewarded by Asia during the first half of 2018 and also in 2016. Nevertheless, what it is relevant for Europe is the progressive increase of financing every year, what makes evident a relevant interest in fintech. In this line, as figured by Woodford (2020) the financing in the second half of 2019 decreased until \$3.4 billion coming most of the financing of 2019 from UK (\$4.9 billion), which gives uncertainty towards Europe in the coming funds in 2020 after the Brexit.

Graphic 6 - Investment from VC in Europe, Asia and USA.



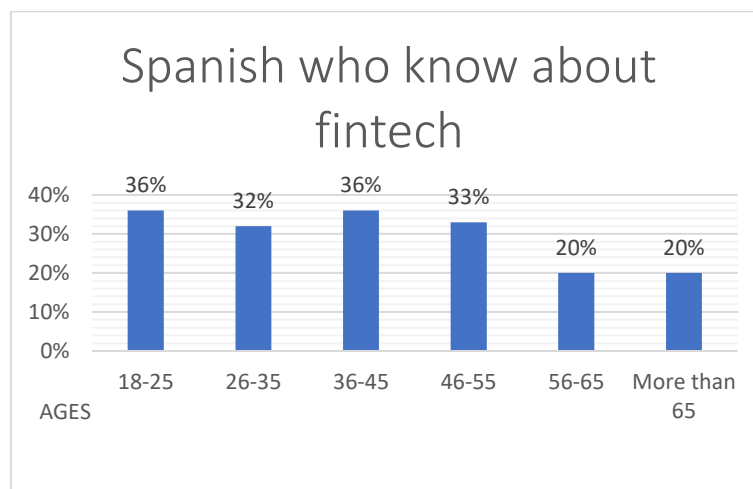
Source: Finch Capital and Delaroom.co

<https://blog.dealroom.co/wp-content/uploads/2019/10/The-State-of-European-Fintech-2019.pdf>

This is explained from the Europeans' view. However, not all countries in Europe follow the same trend or are as updated as all in average: In Spain, the term fintech have been gaining importance in recent years although most people do not know what it is exactly. The real fact explained by J.A. (2020) is that by the end of 2019, there were 385 companies and the total amount invested in fintech was more than 190€ million which is also increasing year by year. However, as has been mentioned, when thinking about new technologies and the usage that people do, especially the oldest ones find

difficulties. However, they are not the only ones with few or no experience in banking. In the following chart from 2019 it is appreciated how many people (grouped by ages) in Spain know about what fintech is: the youngest (who are constantly in contact with technologies) and people between 36 – 45 (probably because they work in that sector) are the most used to this technology. However, people from 56 years old onwards hardly know about those companies (only 20%). Notice as well that no matter the age, the population that know about fintech do not reach 40%. However, the youngest, who are at the same time, the important customers in the future, are the ones more familiarised with fintech and they might choose first fintech rather than a traditional bank.

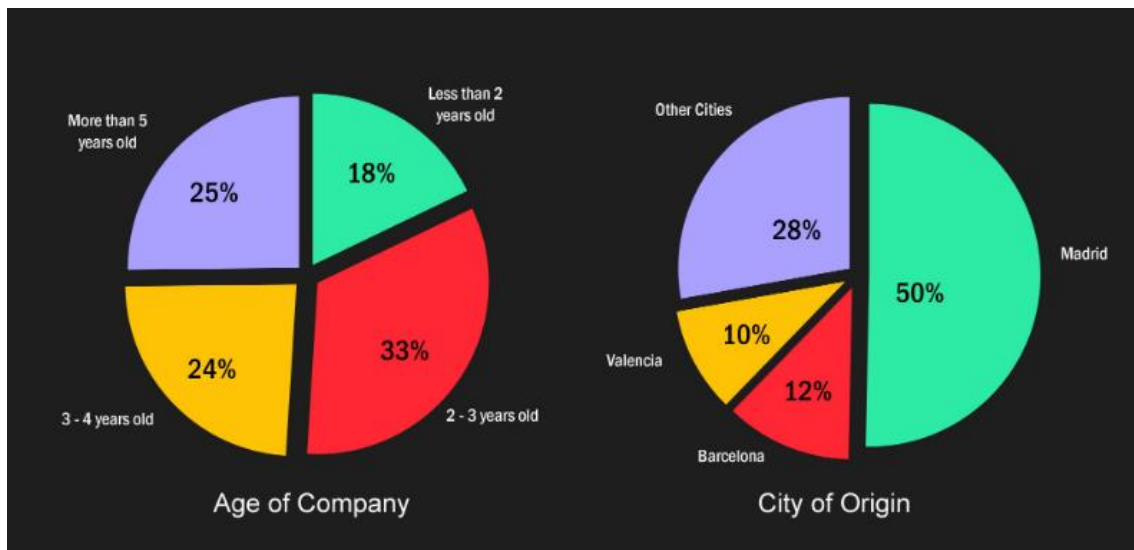
Graphic 7 - Spanish knowledge about fintech.



Source: Asufin (asociación de usuarios financieros) https://tech.asufin.com/wp-content/uploads/2019/12/estudio_encuesta_fintech_asufin_2019.pdf

Furthermore, these start-ups are located through the whole country but the central point could be associated with the main developed/ important cities of Spain: Madrid and Barcelona, as it is shown in the following graphic.

Graphic 8 - Age and place of the fintech in Spain.



Source: Finnovista <https://www.finnovista.com/el-numero-de-startups-fintech-crece-un-16-en-espana-en-un-ano-hasta-las-392/>

The chart comes from a current research on 150 fintech and as it is said half of the startups have been carried out in Madrid. Moreover, in the left chart, it is observed that a few more than a quarter of the startups asked have more than 5 years of experience, which means that a long-term future in the industry is seen for those companies. In addition to this, the 57% have been working from 2-4 years what it also depicts certain stability in the sector.

3.3. Neobanks/Challenger banks.

In the last few years, there has been a growing interest in new banks: the so-called challenger banks and neobanks. Although there is no standardized definition to the term neobank, it refers to the financial technology firms that offer digital or mobile-only financial services. However, while from the customer's point of view the difference between neobanks and challenger banks is negligible, these terminologies are frequently used interchangeably. This slight difference lies in that neobanks usually do not have their own banking licence and offer bank-licensed products through partners. The products offered are described by Sorensen (2019): "Typical neobank services include current accounts, mobile apps, payment cards, money transfers, loans, savings accounts, analytics to improve spending behaviours, among many other financial services."

3.3.1. Contrasting new banks with traditional banks.

Neobanks will pose a challenge to traditional banks in the future as more customers lean toward the convenience of digital-only platforms and enjoy the advantages that neobanks can provide. Furthermore, as it is pointed by Kornitzer (2020): “they expect that number to surge to 98 million by 2024, with the actual number of accounts being roughly twice the number of users.”

One of these advantages, expressed by the website w.up (2019) is the lower operation cost due to the absence of branches. Furthermore, unlike traditional banks, Neobanks do not have to maintain extensive legacy IT systems, because they are using cloud-based infrastructure. The lower operation costs allow to Neobanks to offer lower prices to their customers.

In addition, Neobanks implement new features quickly. The use of innovative tools such as artificial intelligence, robo-advisors or biometrics, contributes to increase customer experience. Moreover, in order to attract more users, neobanks provide personalized services and pay attention to treat well their customers. Responding to feedbacks and using them to make improvements are top priorities.

Finally, as mentioned by Pritchard (2019), at the moment many traditional banks already have mobile applications, but these ones offer less functionality in managing money. The advantages that traditional banks have are coming from their brand value and the finance at their disposal. Neobanks do not offer full range of banking services mainly due to lack of capital. The accounts do not have overdraft authorisation and cheques or cash cannot be deposited.

3.3.2. Examples of this category.

In this section, some examples of these new banks are going to be mentioned. Even if currently there are lots of online banks, the importance of the ones described lies in the following aspects: they are pioneers, but also because of the fast increase the companies have experienced.

Monzo

It was set up in 2015 and it is one of the pioneers, being an example for the coming banks (it is considered one of the best banks in England). As a particularity, Monzo offers its services only in England and EEUU since its preference is to maintain the best service for the customers rather than extend its market in terms of customers increasing the risk assumed too. Its aim is that everyone can manage the money. That is why Monzo

focuses on the customer service and it is reflected in the number of customers increased from the beginning of 2019 (with one million) to the end of the same year (with 3.6 million), as it is pointed by Blomfield (2020). Moreover, the services offered at the beginning were only a debit card with an application but, in 2017 when they got the banking license, they could offer a current account too. This fact made them seem as a traditional bank. However, they cannot offer some financial services as mortgages.

Revolut

Revolut started to operate in July 2015 and although it obtained the banking license in 2018, it does not work as a current bank since its customers' capital is kept and supported through the English banks Lloyds bank and Barclays.

This bank has an especial usage from the international point of view and it is useful for those who are constantly exchanging coins. The main differentiation from others is based on the currency exchange: they offer almost the same exchange as the current market, not making pay huge commissions as traditional banks do. This is what made them competitive and the reason why they get lots of customers. Thus, the benefits revolut obtain come from a small difference between their coin price and the market coin price. Nevertheless, as every bank, there are some restrictions and once the customer exceeds them, a commission has to be paid.

N26

This German bank started to operate in 2013 and the license was obtained in 2016 when their funds were supported by the German Deposit Protection Scheme. At the moment, N26 exhibits a competitive position since it can offer loans. However, while in Germany the maximum amount offered is €25.000, the maximum in Spain is €5000 at the moment. Given that, the bank is not trying to access to mortgages yet.

Being a bank 100% online, a personalised service is offered through the information they give the customers about their balance, trying to be similar to traditional banks in order to attract conservative customers. For instance, the bank estimates usually expenses and incomes in a detailed way each month. Because of all mentioned, N26 is on the top 10 of the world's most valuable fintech start-ups but, from the 15th of April it is not working with England anymore because of the Brexit.

Starling bank

Starling bank is one of the most famous challenger banks in England. It was created in 2014 by Anne Boden, and its banking license was accepted in July 2016. Money

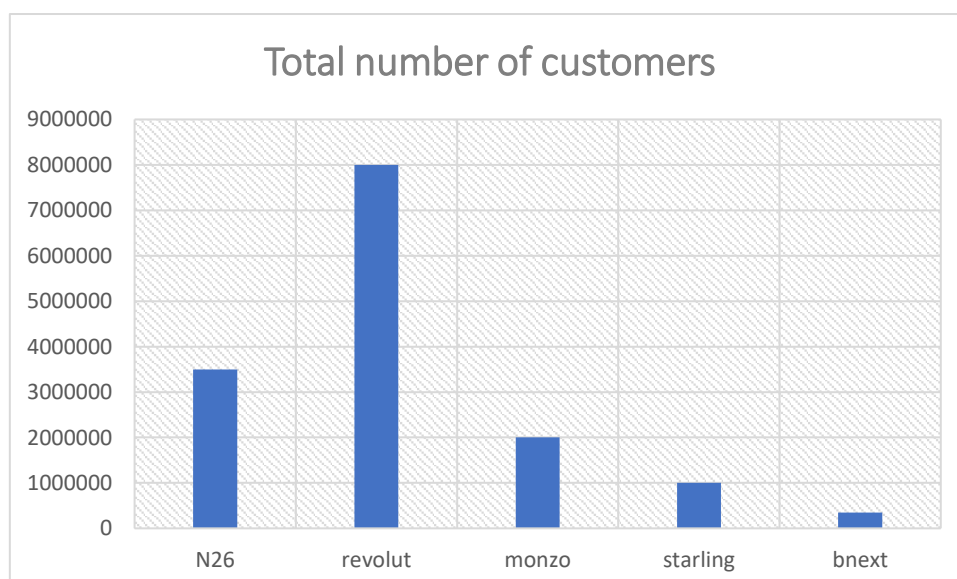
deposited by customers on their accounts is guaranteed by the Financial Services Compensation Scheme (FSCS). Furthermore, from 2018 Starling bank has an agreement with the post office which makes it possible to withdraw cash and deposit money. In addition to this, it is considered in a recent paper by Finextra (2020) as one of the most important banks in England being selected as the 'best british bank' for three years, 'Best Business Banking Provider' and 'Best Current Account Provider' in the British Bank Awards 2020, in Europe they offer high banking fees comparing to other neobanks. However, this situation is changing since Starling is starting to offer the possibility to open an account in Euro.

Bnext

Bnext is the most important neobank created in Spain whose customers are increasing exponentially. It started working in 2016 and the money is supported by Banco Santander. Bnext did not get the banking license until February 2020. Nonetheless, it was not required since the bank could lend and borrow money but the way it did was through another fintech: Bnext works as an intermediary. For example, when lending money Myinversor is the fintech required and when asking for money, Prestalo is the one used for a loan, and Helloteca for a mortgage. As it does not work as a traditional bank, transactions, as setting up a direct debit or transfer money to another account different from a Bnext partner, is not possible since it does not have an IBAN account yet.

Finally, as Bnext does not have any commission for customers, the profits obtained comes from the commissions imposed to third parties as the ones mentioned above.

Graphic 9 - Total number of customers in challenger banks.



Source: Own elaboration from: *Business Insider*

Concluding with this part, the chart depicts all what it has been said. The most important is that Monzo and Starling have focused on expanding but guaranteeing the best experience for customers, what makes the increase slower. N26 follows the same tendency but its growth is more significant since the service is offered in more than 17 countries. Revolut on the other hand, understands that the customers use to be temporary and as consequence of that the interests lie in doing the experience unforgettable in case the users need again its services.

4. Bigtech.

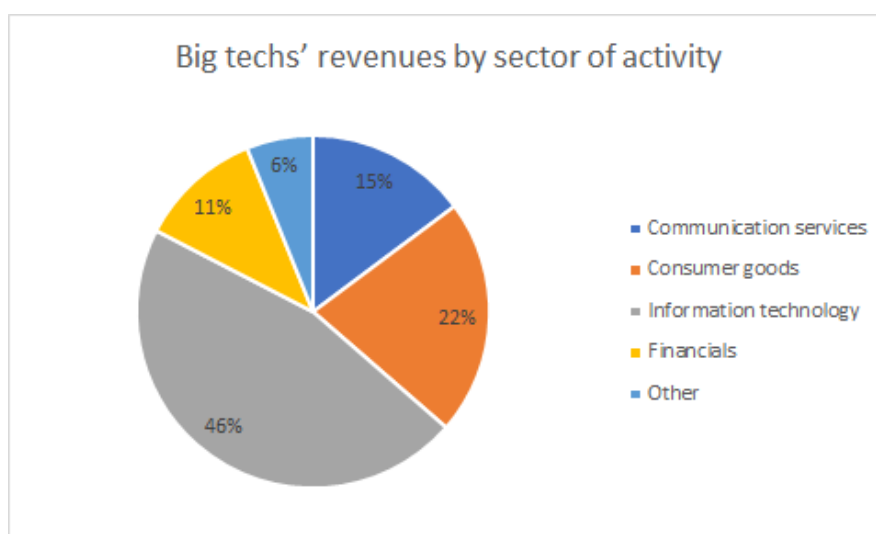
The term “big tech” is used to refer to large technology firms such as Alibaba, Amazon, Facebook, Google, Microsoft, Tencent, etc. The fact that these companies entered the financial sector, have led to some changes in this industry.

Bigtech is a new concept, whose meaning is similar to fintech, since both work 100% online. What distinguishes bigtech from fintech is that they offer financial services as part of their set of activities, while fintech companies are (usually) specialized in a financial product. Bigtech mainly has a worldwide market, a massive capital, and the newest technology.

The following chart shows that the revenue coming from financial services is only the 11% of the total revenue of bigtechs. The sample is based on some bigtechs².

² Alibaba, Alphabet, Amazon, Apple, Baidu, Facebook, Grab, Kakao, Mercado Libre, Rakuten, Samsung and Tencent

Graphic 10 - Bigtech's revenues by sector of activity.



Source: Bigtech in finance: opportunities and risks.

Although finance is not the most important source of revenue for bigtechs, it can mean a threat to financial stability (mainly because regulators find difficult to follow them due to their rapid evolution). The most important facts that have made bigtech growth in the financial sector have been associated with, as mentioned in fintech, the usage of cloud technology (reduces data costs) which consequently leads to the adoption of artificial Intelligence. Another important feature was the few or lack of regulation there was in that big companies that made easy the expansion of their sector. Over and above, with the help of bigtech companies, in some places where a large part of the population normally would remain without banking facilities, basic financial services became available.

It is already said that these firms do not base their activity in financing. Nevertheless, they decided to expand their market in the financial sector. As stated in the report by the Financial Stability Board (2019), the following aspects could explain this step of bigtech firms: first of all, by diversifying their benefits in a different activity, the companies found another way of increasing their revenues. Additionally, if their activity is accompanied by a financial tool created by the company itself, it can complement their original activity (bigtech companies integrate their new financial services into their already existing platforms). This creates a process of synergy that finally makes these firms stronger and more independent from others. Furthermore, the customers find the solution of bigtech companies fast and safe, beside gaining a good experience. Examples of these financial services will be exemplified later. Last but not least, an important aspect could be associated with the huge amount of data that the firm will obtain by providing financial services to their users.

4.1. GAFA (Google, Apple, Facebook, Amazon).

Despite the fact that there are many bigtech companies, the ones that have had great influence on the financial system are the renowned GAFA and BAT (Baidu, Alibaba and Tencent). GAFA (originated from the US) operates in USA and Europe, where the consumer market is totally established there, while, on the contrary, BAT (originated from China) companies are currently establishing their market in emerging countries like India, and not trying to compete in Europe. This section briefly introduces the financial activity of GAFA. Although this project does not cover the description of BAT, they are also bigtech companies that are worth to investigate.

Google

Google started to operate as a searching engine, but today offers a wide range of services to its users, for example Chrome, Drive, Translate, Maps, YouTube or Android. Most of the services and applications are free, because Google aims to have a customer dataset that are familiar with using them. Google's revenue mainly comes from advertisement and this solution allows them to deliver advertising to many people.

In 2015 Google launched Android Pay which 3 years later was rebranded as Google Pay. After the customers give their card information, they can make contactless payments by using their phone³ or pay on websites and in applications safely, as Google Pay uses an encrypted number instead of the actual card number. As a consequence, the details of the card stay secure. Google Pay also has a feature that allows to send money to friends and family, but currently it is only available in the US and India.

After Facebook and Apple, Google is also planning to offer banking services which is expected to be launched in 2020. As shown in mercury-processing news (2020), Google will be partnering with Citigroup and Stanford University's credit union and they will provide a checking account through Google Pay. Real banking would be done by these companies. Google could offer different value-added services, like analytical tools to give consumers greater insights into their spending, or different loyalty program offerings. The project codenamed Cache.

Amazon

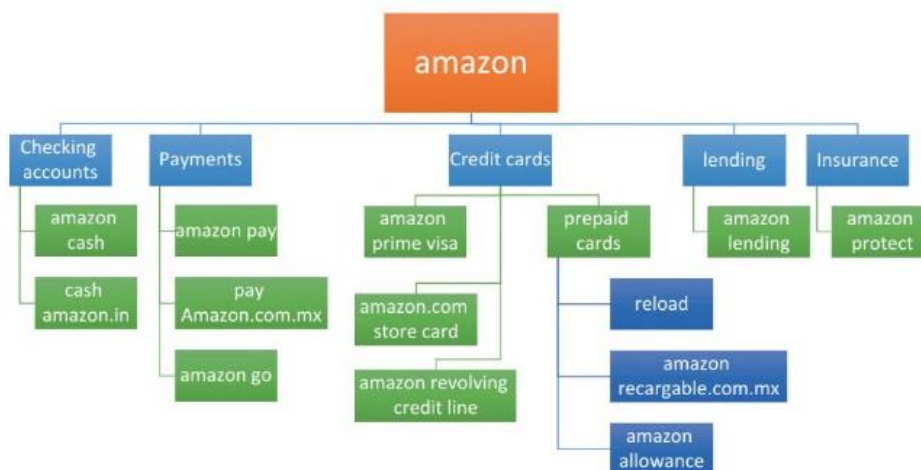
Nowadays, Amazon's activity is based on selling all type of goods. Its number of customers do not stop growing, for this reason experts forecast that: "In a short five-year

³ The phone must work with near-field communication (NFC).

period, up to 70 million consumers may turn to the retail giant for banking services. If the experts are right, Amazon will have more banking customers than citizens have the United Kingdom.” (Ayers R., 2019).

Some years ago, it started to offer financial tools such as credit cards and even insurance products as appreciated in the following figure:

Figure 1 - All financial services offered by Amazon.



Source: Fintech, bigtech and Banks: Digitalisation and Its Impact on Banking Business Models.

This is why different companies (with a small activity) want to join to amazon to sell their products. Furthermore, as a particularity, for those companies that Amazon thinks are important and may need it, they have the possibility to access to loans. However, Amazon is the one which offer the request to access to the loan.

On the other hand, those customers that own the amazon credit card, can agree monthly payments what leads to divide one payment in time and smaller quantities, more affordable, with a maximum of 1000€. Furthermore, not everywhere but in some countries prime customers can access to loans with a maximum of 3000€. In Spain, this action is supported by the fintech Cofidis, which is the one that manages those transactions and definitely accepts/ refuses the loan.

Facebook

Famous social network Facebook is trying to get into the financial system. At the moment, there is a platform that makes possible to make donations for NGO, there are games with payments for accessing to them and users can also buy tickets for events. However, for those transactions there is still a need to insert the numbers of a credit card,

which means that Facebook can access to the user's bank account. Facebook also allows to exchange items (even though at the moment the payment is done by redirecting to the original website). Despite of this, and only in USA, it is available the exchange of money between friends, as if it was bizum, with the app 'Facebook pay' which in the future, it will allow to the exchange of money in WhatsApp and Instagram (both apps are property of Facebook).

In addition to this, although nowadays it has not been launched yet because of the discrepancies that this innovation is causing, Facebook is planning to offer a cryptocurrency called 'Libra'. This will be a new method of payment aimed at exchanging money with no barriers nor cost between countries. Even though users would introduce themselves to the virtual coins' world, it has faced the disapproval of banks given the financial uncertainty it would cause. The ECB shows its fear through this innovation expressed by Mersch (2019, page 19): "Depending on Libra's level of acceptance and on the referencing of the euro in its reserve basket, it could reduce the ECB's control over the euro, impair the monetary policy transmission mechanism by affecting the liquidity position of euro area banks"

Apple

Apple is also one of the most successful companies of the 21st century. Its main revenues come from selling iPhones, but in the recent years, the share of the provided services started to grow. It is considered as a leading innovator, not only in the field of technology but in finance as well.

The report of 'the paypers' (2019, page 22) explains that in 2019 Apple issued a credit card in cooperation with Goldman Sachs. The card is existing both in physical and digital form. In order to encourage the use of Apple Card, each new iPhone comes preloaded with it. Apple also offers a rewards program, called Daily Cash. The cardholders after paying with the digital card, get back 2% of the spent amount, as well as 3% when they buy something in an Apple Store or an Apple Service. The use of Apple card is free. It does not have any annual charge or over-the-limit fee.

The following chart shows the total revenues that those entities have obtained from 2017 until the first quarter of 2020.

Table 2 - Main bigtech innovations⁴.

Year	Google	Amazon	Facebook	Apple
2017	110.55	177.87	40.65	229.23
2018	136.36	232.89	55.84	265.60
2019	160.74	280.52	70.70	260.17
2020	41.2	75.45	17.74	58.31

Source: Own elaboration from Macrotrends, Statista and Venture Beat.

Although the revenues shown are in the whole world, the revenues obtained in Spain from these companies are still larger than most entities' revenues. In addition, these big entities, including GAFAM pay a symbolic tax influencing on the market of the entire world. In Spain, in 2017 big companies payed a tax of 7.7% while medium companies' tax was 14.07% and small companies was 18.37% over their revenues. That is why the European Union⁵ is planning to impose an indirect tax in the 'digital economy', that will be exposed for those entities whose revenues are upper to €750 million and because of their only-online presence, they do not pay equally to other companies. However, bigtechs face their disapproval since all the money they earned is invested in new technologies.

5. How banks are managing the new banking landscape.

Banks need to find another way of achieving the profits that low interest rates cannot offer while taking measures to adapt to the current times. For instance, one revolutionary innovation mentioned by Rolfe (2016), occurred in 2016 thanks to the collaboration of many banks which are run by the Bank of Spain. It is called bizum, a platform used to exchange money through the phone number, which is associated to an account. This procedure is fast, secure and easy reason why most Spanish banks are using it. There are many other innovations that every bank has done by itself. Below, we have a look at what the top four banks have made to adapt to new situation.

Santander

Santander has based its improvements on the goal of surviving against new technologies existing, pointing as a premise saving money by reducing costs. As it was informed by

⁴ The table is expressed in US billion dollar and year 2020 refers only to the first quarter of the year.

⁵Full information available at:https://ec.europa.eu/commission/presscorner/detail/en/IP_18_2041

Garijo (2019), in 2019, Santander invested 20.000€ million in information technology (IT) and digitalization what makes Santander capable of compete with the new bigtech companies. Furthermore, explained by Noticias Bancarias (2020), during this year it will start a programme called TechUp aimed at teaching 50 people to make them know how the technological developments work, and then implement what they have learnt to the banks and workmates.

BBVA

Bbva is one of the best-adapted at present times being the first bank implementing new technologies such as blockchain, bigdata artificial intelligence... Besides, it has been the first bank introducing (thanks to the company Telefónica) 5G, which is the newest internet connexion. It can help doing faster all type of new online operations (Redestelecom, 2019).

Not only technologically, BBVA also tries to innovate in other aspects. For instance, they applied, among others, the new method called “agile”, which started in 2014 and it is a different way of working between the workmates: like a team, instead of individually. They also develop a programme called “ninja”, to train workers with new technologies with the aim of increasing the efficiency. However, BBVA does not try to forget its other concern, which is offering a personalised service focused on each customer. BBVA is improving in the most important features: technology, customers and workers.

Caixabank

From the beginning, Caixabank has been innovative in banking sector. Its most innovative creation took place at the beginning of 2016 with Imaginbank, as it was expressed by Gonzalo Alconada (2018), it was the first bank 100% online, providing money (40€ in case of depositing at least 250 € per month) and discounts to attract more customers, with zero cost suitable for the millennials. Thus, focused on this generation, they can access to their bank account information from their own Facebook, for example.

Furthermore, Caixabank is starting to work with a quantum computer, in terms of mortgages and State Treasury bond. Its task is to calculate the risk in those financial assets and its main benefit has already been appreciated since the results are as valid as the obtained by humans but the time required is highly reduced (CaixaBank, 2019).

Sabadell

Sabadell is one of the most innovative banks in Spain. It has been interested in helping start-ups. Actually, as Sabadell's news (2020) informed, thanks to Innocells, a platform aimed at the digital undertaking expressed that more than 280€ million were invested in

Sabadell Venture Capital and Bstartup that offer financing for entrepreneurs what leads the bank to take part in the companies' equity. In addition, Sabadell is promoting loyalty from freelancers since most of the Spanish people are working under this condition. The way that Sabadell does it is through Nomo, a new app that helps freelancers to manage their business. This app has different cost depending on how much detailed the customer wants the information and they also include a tax advisor that can resolve all financial doubts. Freelancers will not need an extra agent to manage all their financial procedures. Furthermore, it allows customers to calculate their incomes and expenses, digitalizing invoices in order to forecast the tax that might be paid only by looking at their mobile phone.

Despite all this said above, a way of understanding its productivity is through the results offered the study made by Sampedro (2019) in the efficiency's ratio, measured by the operating expense divided by net receipts from banking (all the incomes the banks have earned). In this sense, Sabadell would be the best bank with 46,09% with a big difference from the others showing how much effort they are facing through new times. Similarly adapted but less efficient, BBVA (56,7%) and Caixabank (57,6%) despite its new technologies used, this huge cost is not compensated yet since as said before, they are focused on the knowledge of workers and the newest technologies.

Conversely, Santander's efficiency is 53,4% and it comes not only for the investment in new technologies but also because of the progress with the new banks' acquisitions.

5.1. Digitalization.

Digitalization have changed the way of working in companies but also the lifestyle of many people. The word 'technology' has an effect on every branch because it has moved from being a basic tool for employees to the most competitive complement. Cutting-edge technology provides a competitive advantage increasing efficiency thanks to the reduction of costs. This idea is agreed by the company KPMG (2017, page 18)⁶:

“Under efficiency's premise, new organizational structures have to be identified which lead to a flexible digital model by creating new departments and roles focused exclusively on the digital culture expansion, in a transverse way, for the whole entity (including all departments and not giving only the attention to IT or business). In a similar way, it is a

⁶ <https://assets.kpmg/content/dam/kpmg/es/pdf/2017/04/nivel-madurez-digital-sector-financiero-espana-kpmg-funcas.pdf>

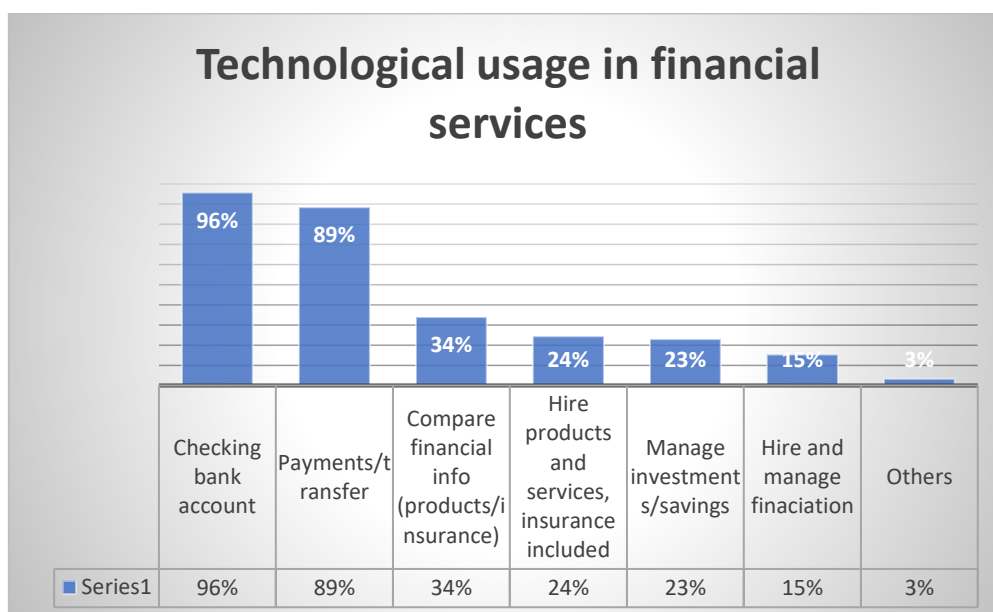
need to teach the employees new technological digital skills as well as to provide them with tools which facilitate innovation, cooperation and mobility.”

This means that people who work in banks also have to do an effort to understand and apply these new technologies. Contrariwise, it would slow down the process towards digitalization, losing competitiveness.

On the other hand, when it comes to potential customers, the usage of smartphones and digital channels is causing the loss of interest from customers to physical offices and, even though the elder are the ones that prefer traditional methods, the fact is that new generations are used to new technologies and they require their banks to be adapted.

Customers, as can be appreciated in figure number 11, start to get used to the basic banking tools such as checking the banking account (96%) or doing payments and transfer money (89%), whereas in more sophisticated issues, such as financing and looking for an insurance, only a 24% would do it with a fintech and only the 23% would manage their investments/ savings.

Graphic 11 - Spanish technological usage in financial services.



Source: Asufin (asociación de usuarios financieros) https://tech.asufin.com/wp-content/uploads/2019/12/estudio_encuesta_fintech_asufin_2019.pdf

Notice as well that Spanish people are more traditional when talking about financing (15%) because there is a real fear about the online method. Most customers prefer to go to a physical place and make use of a personal service, where they can ask all types of

questions. Although this is a relevant fact to consider, the truth is that there are other basic needs that banks need to cover. Banks have to focus on the new customers; otherwise, they will choose new banks more adapted with less costs and bigger profits.

In this sense, Skan et al. (2015, page 6) say: "Banks in this category see themselves as having short term advantages in infrastructure and customer data, but no long term right to exist without adapting to services that solve emerging digital consumer frustrations." It makes everyone think that changes are coming, in order to guarantee their competitiveness.

In addition to all mentioned above, digitalization implicates to increase information exposure on the website (personal database, the expenses, incomes...) and because of that, it is required what is called cybersecurity, which gives the certainty that the platform is protected, and avoids impersonation. Nevertheless, this causes huge costs that banks have to deal with, since improving and adapting to new technologies are the basic tools for the innovation.

Finally, one of the biggest fears of online transactions is phishing, which is when a hacker steals personal data regarding account by sending an email, usually coming from a company (which gives more certainty for the cheated and consequently hackers guarantee themselves that it will be opened). The users need to download a file or open a link and, once they have done it, the hacker can access to all the information the person has on the mobile phone/computer.

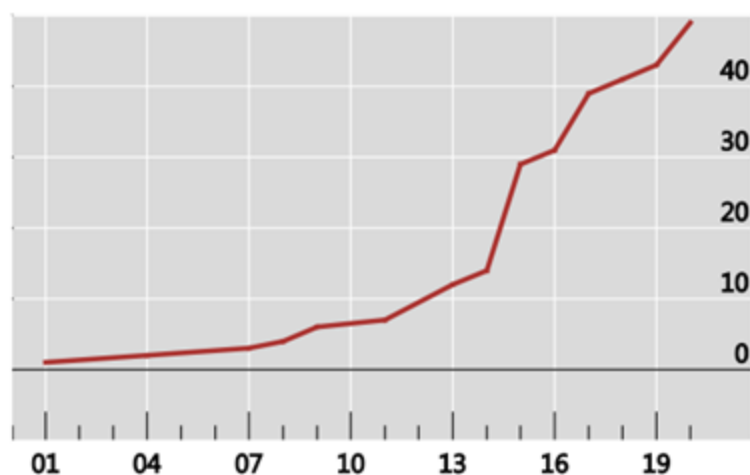
5.2. Collaboration with traditional banks.

The way these new companies work, and the speed of their progress, leave traditional banks no more options to survive but collaborate with them or fully adapt to the new scenario. The reason why bigtech firms are playing more significant role in the financial industry is due to the data that they already have. Actually, this means an important advantage over traditional banks. Bigtech companies have worldwide popularity and a huge number of customers who are familiar with their platforms and probably use them every day. As a result, they are more likely to choose this alternative method of payment or financial services, than the ones that traditional banks can offer. Taking the opportunity, and thanks to the amount of data that those platforms have access, the companies can offer personalized products since they know the customers' needs.

In order not to lose their importance and competitiveness, it is crucial for banks to understand that bigtech will not stop growing. This fact is supported in the following

graphic, which shows the change in the number of offered financial services by bigtechs during the years between 2001 and 2019.

Graphic 12 - Number of financial services over time.



Source: Financial Stability Board (FSB).

It is appreciated how at the beginning few services were offered by those companies and how it experienced from 2013 an exponential growth since they have found the profitability by diversifying their services offered. Nowadays the customers can choose between more than 50 different types.

For this reason, cooperating could be seen beneficial for both parties. It is important to notice that bigtech companies do not intent to work as a traditional bank. This is mainly because it would mean assuming huge costs and also following the rules of the banking license. For instance, as exemplified by De la Mano and Padilla, (2018, page 16), bigtech could be the ones that offer specific financing such as loans or investment products to the final customers, using the advantage of the ability to offer more personalised services, but at the end, the process would be finished by the traditional banks.

The most basic service that a bigtech company can provide, is a payment service. This is usually created as part of an existing online retail platform. Furthermore, lending is also a widespread service amongst these firms, as it can contribute to increase the sales of their original services or products. In accordance with the image of the company or the provided services, some bigtech even offer insurance products, for example related to healthcare, car insurance, etc. However, bigtech are pretending to keep those bank's services but without stopping in the progress of their own activity. Bigtech will still need banks' help. In this context the traditional banks would manage the money of the

customers and they would be the responsible entity for the banking product. In consequence, bigtechs would run the paper as “intermediaries” between customers and the banks. The partnership between bigtechs and traditional banks can be implemented in different ways. Bigtech firms can be service providers by which traditional banks can reduce the operating cost and increase the speed of their service. Another way for bigtechs is to make partnership with licenced banks in order to operate without being regulated as banks. This allows them for example to issue a credit card or access to money for providing loans. Financial markets or institutions also have the possibility to lend money for bigtech firms and in this sense, the technological companies could provide lending services to the customers through digital banks, which makes the whole process more comfortable. As it is mentioned before, bigtechs are also able to provide insurance for the customers. Like in all cases, in this one as well, the object is to avoid the regulations that comes from having a licence. Opening joint ventures with incumbent insurance companies can be the solution.

6. Regulation.

The innovations that are coming with the technological improvements made it necessary to reconsider the already existing regulations. The financial sector has to be strictly regulated in order to guarantee the reliability of the institutions and reduce the risk of a new financial crisis. This argument is supported by González-Páramo (2017, page 6) where the aim is to safeguard the stability of the financial system by ensuring that the vital roles played by the banking sector in the economy do not suffer significant disruption or that the institutions do not collapse. In order to guarantee all this said, General Data Protection Regulation (GDPR) and the Payment System Directive (PSD) or PSD2 (renewed version) played a key role. These two regulations act in the opposite direction. While the purpose of GDPR is the protection of customer data, the PSD2 provides greater access to customer data for third parties.

Summarised by the European Union ⁷, the GDPR is a law which is destined to the online security and it is one of the strictest in the world. The violation of GDPR has serious financial consequences. Although this law belongs to the EU, the obligations that must be respected are directed at any company in the world. The regulation started to be imposed in May 25, 2018. Meanwhile, the PSD was originated in 2007 with the purpose

⁷ For further information about GDPR: <https://gdpr.eu/what-is-gdpr/>

of speeding up payments between different countries avoiding the expenses assumed previously. It also guaranteed and gave more safety between the financial companies, the customers and the banks, becoming a unique market in Europe. This system was extended into the PSD2 in 2015 increasing the safety when buying online, given the evolution of the digitalization and the financial system. It benefits those companies, the Third-Party Payment Service Providers (TPP's) providing a license that gives the capability of offering financial services and being able to access to the customers' bank account (with the previous consent of the customer). This is a phenomenon called open banking.

For instance, in case of providing information about customers but ignoring the protection of their personal data, the banks can cause serious damage to them. If the bank follows the regulations and published customer data according to GDPR, but the TPP do not, the latter is responsible for the consequences. In this sense, PSD2 makes it harder not to violate GDPR. Nevertheless, without GDPR the market opportunities created by PSD2, would not be possible within the appropriate framework increasing the customers' risk.

This regulation is not used in all countries yet but the EBA (European Banking Authority) has fixed the limit in December 2020 to be implemented in all Europe.

6.1. Sandbox regulation.

When it comes to the regulation regarding to new technologies, there are features difficult to consider either for their innovative position or because there are not enough companies offering these services yet. In order not to slow down the activity of those entities, there is a specific regulation through sandbox, a regulatory framework born in UK in 2015. Its usage, defined by BBVA (2017), focuses on: "Testing grounds for new business models that are not protected by current regulation, or supervised by regulatory institutions. These testing grounds are especially relevant in the fintech world, where there is a growing need to develop regulatory frameworks for emerging business models".

In Spain, sandbox was passed the 18th February 2020 and it is supported by the Fintech and Insurtech Spanish Association (AEFI). In a statement, AEFI (2020) also considers that this system places Spain in a competitive and beneficial position in the World regarding to innovation in fintech. At the same time, it leads to the increase of employment helping to reduce the famous brain drain in the last years as well as the development of these new start-ups.

7. Conclusion.

The banking sector has faced with huge operational costs and a scenario with negative interest rates over the last years. Additionally, banks have to deal with new rivals with ultra-lower costs: fintech and bigtech companies related to financial services.

Fintech are companies whose main activities regarding finance are lending money, offering insurance, or even depositing money in an account doing daily transactions. Neobanks and challenger banks are an example of them. Nowadays, these new competitors may offer similar services to those offered by traditional banks but with much lower or even no fees.

Regarding bigtech, their main activity is not offering financial services, but they are a complement of their main primary activity. These companies have a huge number of customers that are keen on faster procedures when buying online. Particularly GAFAs companies are seen as an important competitor since most of the customers have positively valued the experience thanks to the safety and convenience they offer with financial services such as Apple Pay.

These new entrants have advantages that banks do not: the regulation they are subject to is less severe, so that they can access easily to customers' personal data, and moreover, their internal costs are very low, and have more simplified and specified services.

Nowadays, consumers demand the creation of banks adapted to new technologies with innovative services, lower fees and 24/7 online services. From this research we conclude that

the best solution for traditional banks would be partnering with the new financial companies that are rapidly increasing, maximizing the synergies that each part (traditional banks and new entrants) can contribute. Only those traditional banks that understand that technological change is here to stay, could be able to adapt and survive in the long term.

8. Webgraphy.

AEFI, 2020. *La aprobación del Sandbox propiciará un entorno adecuado para el desarrollo del ecosistema Fintech en España.* [Online] Available at: <https://www.asociacionfintech.es/noticias-aeFI/la-aprobacion-del-sandbox-propiciara-un-entorno-adecuado-para-el-desarrollo-del-ecosistema-fintech-en-espana/> [Accessed 2020 05 03].

Ayers, R., 2019. *Readwrite.* [Online] Available at: <https://readwrite.com/2019/09/23/is-amazon-bank-the-future-of-banking/> [Accessed 01 05 2020].

BBVA, 2017. *BBVA.* [Online] Available at: <https://www.bbva.com/en/what-is-regulatory-sandbox/> [Accessed 03 05 2020].

Bermejo, I., 2020. *La Razón.* [Online] Available at: <https://www.larazon.es/economia/20191227/vbjsiw4itfbchoqueg57pgnliq.html> [Accessed 24 03 2020].

Blomfield, T., 2020. *Monzo.* [Online] Available at: <https://monzo.com/blog/monzo-in-2020-looking-back> [Accessed 01 03 2020].

CaixaBank, 2019. *CaixaBank communication.* [Online] Available at: https://www.caixabank.com/comunicacion/noticia/caixabank-develops-the-first-applying-quantum-computing-to-financial-activity-in-spain_en.html?id=41876 [Accessed 14 05 2020].

Clement, J., 2020. *Statista.* [Online] Available at: <https://www.statista.com/statistics/266206/googles-annual-global-revenue/> [Accessed 04 05 2020].

Constâncio, V., 2016. *European Central Bank.* [Online] Available at: https://www.ecb.europa.eu/press/key/date/2016/html/sp160707_1.en.html [Accessed 17 03 2020].

De Guindos, L., 2019. *European Central Bank.* [Online] Available at: <https://www.ecb.europa.eu/press/key/date/2019/html/ecb.sp190625-6d33411cff.en.html> [Accessed 25 03 2020].

Economía 3, 2020. *El Banco de España insta a la banca a revisar su modelo de negocio.* [Online] Available at: <https://economia3.com/2020/02/13/249512-el-banco-de-espana-insta-a-la-banca-a-revisar-su-modelo-de-negocio/> [Accessed 20 04 2020].

European Commission, 2018. *European Commission.* [Online] Available at: https://ec.europa.eu/commission/presscorner/detail/en/IP_18_2041 [Accessed 26 04 2020].

Finextra, 2020. *Finextra.* [Online] Available at: <https://www.finextra.com/pressarticle/81819/starling-tops-the-best-british->

bank-awards-for-the-third-year-in-succession

[Accessed 13 04 2020].

Garijo, M., 2019. *Business Insider*. [Online]
Available at: <https://www.businessinsider.es/plan-estrategico-santander-inversion-20000-millones-4-anos-399241>

[Accessed 10 05 2020].

Gonzalo Alconada, Á., 2018. *Cinco Días*. [Online]
Available at: https://cincodias.elpais.com/cincodias/2018/05/15/companias/1526410840_907692.html

[Accessed 10 04 2020].

Green, R., 2020. *Business Insider*. [Online]
Available at: <https://www.businessinsider.com/n26-reaches-5-million-user-milestone-2020-1?IR=T>

[Accessed 15 04 2020].

Green, R., 2020. *Business Insider*. [Online]
Available at: <https://www.businessinsider.com/starling-projects-it-will-break-even-in-2020-2019-8?IR=T>

[Accessed 15 04 2020].

Kornitzer, D., 2020. *Paysafe*. [Online]
Available at: <https://www.paysafe.com/en/blog/neobanks-vs-traditional-banks-who-has-the-advantage/>

[Accessed 13 04 2020].

Marietje, S., 2020. *Financial Times*. [Online]
Available at: <https://www.ft.com/content/36f838c0-53c5-11ea-a1ef-da1721a0541e>

[Accessed 30 04 2020].

Mercury-Processing, 2020. *Mercury Processing Services International*. [Online]
Available at: <https://mercury-processing.com/industry-news/google-citibank-deal-cache/>

[Accessed 02 05 2020].

Nonninger, L., 2020. *Business Insider*. [Online]
Available at: <https://www.businessinsider.com/monzo-secures-massive-customer-base-2019-9?IR=T>

[Accessed 15 04 2020].

Noticias Bancarias, 2020. *Noticias Bancarias*. [Online]
Available at: <https://noticiasbancarias.com/bancos/01/04/2020/banco-santander-lanza-techup-un-programa-de-desarrollo-profesional-para-jovenes-con-perfiles-tecnologicos/209031.html>

[Accessed 06 05 2020].

Paypers, 2019. *The paypers*. [Online]
Available at: <https://www.europeanpaymentscouncil.eu/sites/default/files/inline-files/Payment%20Methods%20Report%202019%20-%20Innovations%20in%20the%20Way%20We%20Pay.pdf>

[Accessed 01 05 2020].

Pritchard, J., 2019. *The Balance*. [Online]
Available at: <https://www.thebalance.com/what-is-a-neobank-and-should-you-try-one-4186468>

[Accessed 10 04 2020].

- Protalinski, E., 2020. *Venture beat*. [Online] Available at: <https://venturebeat.com/2020/04/28/alphabet-earnings-q1-2020/> [Accessed 04 05 2020].
- Redestelecom, 2019. *Redes&Telecom*. [Online] Available at: <https://www.redestelecom.es/infraestructuras/noticias/1115916001803/bbva-primer-banco-de-espana-desplegar-5g-sede.1.html> [Accessed 13 05 2020].
- Rolfe, A., 2016. *PCM*. [Online] Available at: <https://www.paymentscardsandmobile.com/spanish-banks-launch-mobile-payments-initiative-bizum/> [Accessed 13 05 2020].
- Sabadell, 2020. *Sabadell News*. [Online] Available at: <https://prensa.bancsabadell.com/en/News/2020/02/banco-sabadell-has-provided-more-than-280-million-euros-in-funding-to-startups> [Accessed 13 april 2020].
- Sampedro, R., 2019. *Expansión*. [Online] Available at: <https://www.expansion.com/empresas/banca/2019/12/25/5e03d745e5fdea8e028b45cf.html> [Accessed 10 04 2020].
- Sereno, E., 2020. *Caja Rural de Teruel cumple 100 años apostando por mantener la banca de proximidad*. [Online] Available at: <https://www.eleconomista.es/aragon/noticias/10340835/02/20/Caja-Rural-de-Teruel-cumple-100-anos-apostando-por-mantener-la-banca-de-proximidad.html> [Accessed 27 03 2020].
- Sobrino, R., 2020. *Cinco días*. [Online] Available at: https://cincodias.elpais.com/cincodias/2020/03/23/companias/1584986442_730296.html [Accessed 01 04 2020].
- Sorensen, E., 2019. *Mobile transaction*. [Online] Available at: <https://www.mobiletransaction.org/what-is-a-neo-bank/> [Accessed 14 04 2020].
- Tesfaye, M., 2019. *Business insider*. [Online] Available at: <https://www.businessinsider.com/revolut-targets-huge-raise-to-fuel-ambitious-global-expansion-plans-2019-10?IR=T> [Accessed 10 04 2020].
- Vega Ortega, J., 2020. *Cinco Días*. [Online] Available at: https://cincodias.elpais.com/cincodias/2020/02/18/emprendedores/1581985162_025872.html [Accessed 18 02 2020].
- Wolford, B., 2020. *GDPR.EU*. [Online] Available at: <https://gdpr.eu/what-is-gdpr/> [Accessed 01 05 2020].

Woodford, I., 2020. *Sifted*. [Online]
Available at: <https://sifted.eu/articles/uk-fintech-investment-2019/>
[Accessed 27 04 2020].

Zuloaga, J., 2020. *El Confidencial*. [Online]
Available at: https://www.elconfidencial.com/empresas/2020-03-30/coronavirus-pone-peligro-extincion-mitad-oficinas-bancarias_2517631/
[Accessed 23 04 2020].

9. Bibliography.

ASUFIN, 2019. *tech.asufin*. [Online]
Available at: https://tech.asufin.com/wp-content/uploads/2019/12/estudio_encuesta_fintech_asufin_2019.pdf
[Accessed 20 04 15].

BDE, 2017. *Banco de España*. [Online]
Available at: https://www.bde.es/f/webbde/Secciones/Publicaciones/OtrasPublicaciones/Fich/InformeCrisis_Completo_web.pdf
[Accessed 20 03 2020].

BDE, ND. 4. *Credit institutions and credit financial intermediaries*. [Online]
Available at: <https://www.bde.es/webbde/es/estadis/infoest/a0446e.pdf>

BIS, 2019. *BIS (Bank of International Settlements)*. [Online]
Available at: <https://www.bis.org/publ/arpdf/ar2019e3.pdf>
[Accessed 01 04 2020].

De la Mano, M. & Padilla, J., 2018. Big tech Banking. *Journal of Competition Law & Economics*, 14(4), p. 37.

Domínguez Martínez, J. M., 2019. *Instituto Universitario de Análisis Económico y Social*. [Online]
Available at: http://www3.uah.es/iaes/publicaciones/DT_05_19.pdf
[Accessed 03 04 2020].

FSB, 2019. *Financial Stability Board*. [Online]
Available at: <https://www.fsb.org/wp-content/uploads/P091219-1.pdf>
[Accessed 10 05 2020].

González Páramo, J. M., 2017. Financial innovation in the digital age: challenges for regulation and supervision. *Revista de Estabilidad Financiera*, 32(9), p. 37.

Jiménez Gonzalo, C. & Tejero Sala, H., 2018. Cierre de oficinas bancarias y acceso al efectivo en España. *Revista de Estabilidad Financiera*, Issue 34, p. 39.

Kale, S., 2018. *Reserve Bank of India*. [Online]
Available at: <https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/WGFR68AA1890D7334D8F8F72CC2399A27F4A.PDF>
[Accessed 20 03 2020].

KPMG, 2017. *assets.kpmg*. [Online]
Available at: <https://assets.kpmg/content/dam/kpmg/es/pdf/2017/04/nivel-madurez->

digital-sector-financiero-espana-kpmg-funcas.pdf

[Accessed 20 03 2020].

Mersch, Y., 2019. *European Central Bank*. [Online] Available at:

<https://www.ecb.europa.eu/pub/pdf/other/ecb.ecblegalconferenceproceedings201912~9325c45957.en.pdf>

[Accessed 01 05 2020].

Ruiz Rodríguez, M. d. C. & Castilla Polo, F., 2016. El papel de la información financiera en la evolución reciente del sector bancario español. *Revista de Estudios Empresariales*, Issue 2, pp. 55-74.

Skan, J., Dickerson, J. & Masood, S., 2015. *Accenture*. [Online] Available at: https://www.accenture.com/_acnmedia/accenture/conversion-assets/dotcom/documents/global/pdf/dualpub_11/accenture-future-fintech-banking.pdf [Accessed 25 03 2020].

Tanda, A. & Schena, C. M., 2019. *FinTech, BigTech and Banks: Digitalisation and Its Impact on Banking Business Models*. Pavia: Springer.

W.up, 2019. *Fintech futures*. [Online] Available at: <https://www.bankingtech.com/files/2019/03/beyond-banking-white-paper-wup.pdf>

[Accessed 31 03 2020].