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An overview of the effects of FinTech on the
international financial sector

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Abstract

"Financial technology" or "FinTech" has transformed the financial sector, changing how incumbent financial institutions interact with each other and with consumers. The interlinkage of finance and technology has given rise to a new type of digital products and services which are highly demanded by society. This study aims to analyze how the new era of FinTech has emerged in the developed and developing world. FinTech has posed important challenges for market participants such as banks in balancing their potential benefits with the new approaches to technology financial products.

The results show that new forms of interaction have appeared between banks and fintech companies for adapting to the need for digitalization. These relationships are affected by challenges raised in these technologies such as regulation or customer privacy breach and are also affected by the presence of other big technological financial players. The findings of this study support the need to modernize the traditional financial institutions for facing the international disruption in the financial paradigm caused by FinTech.

TÍTULO	Una visión general de los efectos de FinTech en el sector internacional financiero
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Resumen

La "tecnología financiera" o "FinTech" ha transformado el sector financiero, cambiando la forma en que las instituciones financieras tradicionales interactúan entre sí y con los consumidores. La interrelación de las finanzas y la tecnología ha dado lugar a un nuevo tipo de productos y servicios digitales muy demandados por la sociedad. Este estudio pretende analizar cómo ha surgido la nueva era de las FinTech en los países desarrollado y en vías de desarrollo. Las FinTech han planteado importantes retos para los participantes en el mercado, como los bancos, a la hora de equilibrar sus posibles beneficios con los nuevos enfoques de los productos financieros tecnológicos.

Los resultados muestran que han aparecido nuevas formas de interacción entre los bancos y las empresas fintech para adaptarse a la necesidad de digitalización. Estas relaciones se ven afectadas por los retos que plantean estas tecnologías, como la regulación o la violación de la privacidad de los clientes, y también se ven afectadas por la presencia de otros grandes participantes financieros tecnológicos. Las conclusiones de este estudio apoyan la necesidad de modernizar las instituciones financieras tradicionales para afrontar la disrupción internacional en el paradigma financiero causada por las FinTech.

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1. INTRODUCTION

The rise of FinTech has recently drawn significant attention to the financial services industry. The study of the effects that these technology-enabled services have in the financial sector has become an important topic of analysis. However, few researchers have focused on the consequences for the traditional institutions around the world which is a relevant issue to research since the socioeconomic factors of each country could affect differently the performance of fintech companies, and consequently the response of the other financial institutions.

The general purpose of this paper is to give an overview of the effects of financial disruption provoked by FinTech in different countries. The specific purposes are to analyse the interaction between the most affected financial institutions and fintech companies, to observe which financial services or sectors have been more affected and to research if other technological companies are also innovating in the financial sector.

For that reason, it is believed that this paper could be of some utility as a basis for further research in the topic discussed of FinTech in the financial landscape.

The dissertation is divided into five main sections. The section 2 reviews the evolution of financial services and technology, and different classifications of the typology of FinTech. The third section considers the global development of fintech companies, particularly focusing on the geographical areas where their evolution is more different such as emerging and developed countries.

In the next two sections, it is discussed how banks have faced the success of fintech companies and developed new forms of interaction between both. First, the global response of banks is considered, but the particular case of banking institutions in Spain is also examined. In addition, a secondary focus appears in these two sections on the effects of Big Technology companies on banks. The fifth section summarizes the main challenges that FinTech will face in the future and the current risks they need to confront. The final section seeks to provide a discussion to understand how banks and fintech companies can face the current disruption in the financial landscape.

2. CONCEPTUALIZATION OF FINTECH

2.1 Definition and evolution of FinTech

The development of fintech firms has led to innovative financial services, suppliers and technologies that satisfy a wide range of customer's needs. To understand the evolution of this phenomenon we first need to define the term FinTech. However, it is difficult to conceptualize because FinTech is actively in development, and it still has room for further evolution. Nonetheless, some important institutions have created their own definition of the term.

The National Economic Council (NEC) of USA broadly defined FinTech in 2017 as “a wide spectrum of technological innovations which impact a broad range of financial activities, including payments, investment management, capital raising, deposits and lending, insurance, regulatory compliance, and other activities in the financial services space” (National Economic Council, 2017)

The Bali Fintech Agenda, launched by the International Monetary Fund and the World Bank, explains Fintech as “the advances in technology that have the potential to transform the provision of financial services spurring the development of new business models, applications, processes, and products” (IMF, 2018)

The Financial Stability Board (2017) defines FinTech as “technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on the provision of financial services”

Altogether, FinTech can be described as the group of companies that seeks to deliver new technology for a better use of financial services and operations. FinTech is often seen as a new concept from the last century but there exists a longer history that brings us back to the origins in the 19th century when FinTech 1.0 emerged. (Arner, 2016)

The first stage of FinTech 1.0 or the first stage of financial globalization lasted from 1866 to 1933. During this period two important events took place; first the transatlantic cable reduced the communication time from North America to Europe from ten days to 17 hours, and then the Fedwire was installed.

The second stage of FinTech 1.0 was during the post-war period from 1945 to 1967 where credit cards were open to the public thanks to Diners Club. Also, some financial services were created like Telex, a machine used among businesses to send electronic written messages. (Leong and Sung, 2018)

Some years later, during FinTech 2.0 from 1967 to 2008 banks built an important IT infrastructure with some innovative digital financial services such as ATM by Barclay, SWIFT, mobile phones, stock exchanges or central clearing houses. (Varga, 2017)

This era was the origin of modern banking and marked the beginning of some of the technologies used today. The great digitalization of traditional financial institutions arrived together with the appearance of the Internet.

Later in 2008, the global financial crisis arose, and this phenomenon was the predecessor of the next phase, FinTech 3.0 (2008 - present). This crisis fostered the growth of the FinTech industry with some new players (start-ups) popping up where existing large companies, mainly the pioneers, were already leading the market. (Arner, 2016)

In addition, the crisis had some negative consequences for banks and customers. On the one hand, the stability of banks was compromised and also their public perception in a way that people started distrusting these financial institutions. On the other hand, post-financial crisis reforms have raised bank's obligations and changed structures to prevent bank failure. This era has also brought relevant digital services like the introduction of Bitcoin in 2009, followed by other cryptocurrencies and trends like electronic wallets. (Giglio, 2021)

FinTech 3.0 emerged because of the financial crisis in the West. However, in the East the FinTech performance has been accelerated because of economic development. It is known as FinTech 3.5 and its focus is in two regions: Asia and Africa. (Arner, 2016)

The governments in these continents want to foster the development of the FinTech industry by adapting their policies and regulatory regimes. Their purpose is to create efficient financial markets in order to increase their economic profits and to attract investors from developed countries. (European Commission, 2013)

2.2 Typology of FinTech

There exist different possibilities for classifying fintech firms. For example, Arguedas, Sánchez and García (2019) classify fintech companies according to their nature. They are classified as start-up firms, unicorn firms or GAFAs. However, this classification is rather subjective because it can be used for other sectors different from FinTech.

The focus of the classification explained below comes from a report of KPMG in 2022 about the Pulse of FinTech. They classify fintech firms according to their functionality.

- Payments: electronic methods of payments without using a physical card as for example, contactless payments. This type of service can be offered in an indirect form via other firms or directly through their own application for paying. In addition, some companies are creating agreements to benefit from each other and give discounts to clients for frequent use. For example, El Corte Ingles collaborates with the application Waylet launched by Repsol so clients can pay through this application. (AEFI, 2021)

KPMG expects that these new payment methods, such as the ones provided by challenger banks will intensify. These are 100% digitized banks that offer services through an application or website and promote themselves through social networks. Their structure is more simple than traditional banking, in fact, they usually don't have a banking license.

- InsurTech: companies that exploit the insurance sector applying new modern methods to improve efficiency and savings. For example, the type of services expected are insurance coverage without the need of a physically suited professional or documentary evidence important to settle claims. (AEFI, 2021)

An increase in competition in the sector is expected, not only from start-ups that want to gain a foothold in the market, but also from big techs, as the case of Amazon entering the insurtech market with “Amazon Insurance Accelerator”. (Mooney, 2019)

- RegTech: involves all companies that offer services based on innovative technology to facilitate other company's regulatory requirements compliance. Since the global financial crisis of 2008, the regulatory framework of the financial sector has increased, and the costs of complying with it too. The purpose of RegTech is to use the technology to reach a high volume of information in a short period of time to help the companies with the compliance of the regulatory requirements. (AEFI, 2021)

- Cybersecurity: also referred to as online client identification. Nowadays, people are demanding security in the digitalization of the financial sector due to some disruptions that gained international attention in the last years. Some companies have taken advantage of the situation to create an important market niche, online client identification.

Technology plays an important role to develop this service, some companies use biometric techniques to identify clients. Some of the most used techniques in our electronic devices are facial recognition and fingerprint recognition. Thanks to online identification, a person can prevent money laundering and other frauds. (AEFI, 2021)

For example, KPMG reports that Secure DevOp¹ as a prevention tool is gaining importance in the market since cyberattacks evolve at the same time as technologies do. Increasing investment in related areas is a basic tool to enable a rapid change without risk exposure.

¹ DevOp is a concept that relates development and operations in a continuous automated application development cycle. Secure Devops are a secure solution for organizations. (Pooj, 2016)

- **WealthTech:** also referred to as asset management and advisory services. These companies offer investment advisory and investment solutions according to the client's needs. They can offer strategies formed by their wealth advisors or they can analyze the client's strategies and execute them in a proper way. Usually, they offer market monitoring in risks, diversification, yields and investment wallets. (AEFI, 2021)
- **Blockchain & Cryptocurrency:** companies that base its business in cryptocurrencies thanks to the advances in blockchain technology. Cryptocurrencies are alternative methods of payment to physical money in the form of virtual currencies. (AEFI, 2021) Currently there is no central financial institution managing them which means that the sector is decentralized. However, companies' interest in cryptocurrencies keeps on increasing even if it's not clear towards which direction the sector is going, according to Brian Heaver in the report of KPMG.

Apart from the classification of KPMG, it is important to define other technological companies which are not a type of FinTech, but rather a competitor that is affecting their performance as well as the financial sector's:

- **BigTech:** large technological companies with extensive established customer networks. (FSB, 2019). The main bigtech companies are Apple, Amazon, Facebook and Google, but there are also some other relevant companies in this sector such as Alibaba or Baidu. (Gorjón, 2021)

3. GEOGRAPHICAL ANALYSIS OF THE FINTECH INDUSTRY

In recent years digitalization has come as a major transformation for the global financial system. Accelerated by the pandemic situation it has reached the most significant progress. However, digitalization is a continuous process that started decades ago and still has much more to do in the economy.

As KPMG reports in 2022, global fintech investments reached \$210 billion with 5,684 deals in 2021 breaking its previous records. During 2020, investment was affected by the disrupting events during the pandemic situation. (Figure 1)

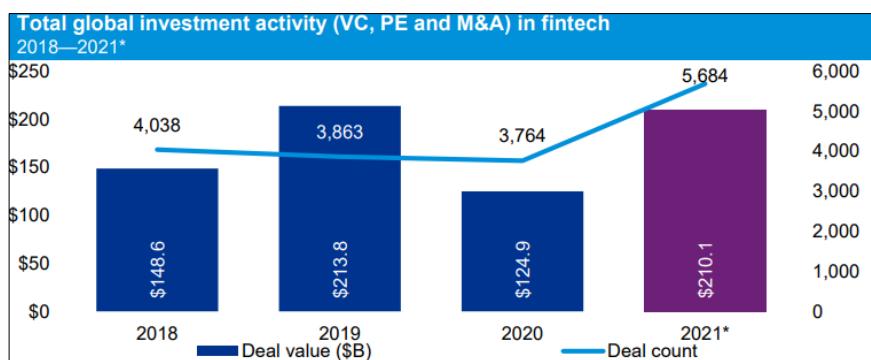


Figure 1. Total global investment activity in FinTech (KPMG, 2022)²

Global venture activity investment also rose from the previous year reaching a record of \$115 billion in 2021. In terms of investment, it is also important to point out that 2021 was a good year for the crypto and blockchain sector raising \$30 billion. It is expected that this interest and investment in the crypto space will continue to grow, including areas such as governance and assurance. (KPMG, 2022)

At a global level, we can make some distinctions in the FinTech map between countries in developed and developing markets. On the one hand, new digital technologies became more powerful in developed markets when the global financial crisis arrived because of the necessity of seeking new opportunities.

² Venture Capital (VC), Private Equity (PE), Mergers and Acquisitions (M&A)

On the other hand, developing markets started to exploit new digital technologies in the context of underdeveloped banking systems. Some authors also defend that the purpose of digital transformation has been different for the global north and the global south, namely ‘transforming banking’ and ‘banking the unbanked’ respectively. (Wójcik, 2020)

Taking into account the current global evolution and the main differences in the sector between developed and developing economies, the purpose of this section is to analyse the evolution of FinTech in the different countries. The main focus is on Europe, the Americas, Asia and Africa. These regions are the most affected by FinTech evolution and it is interesting to analyse how FinTech develops in each area according to its economic and social environment.

3.1 Europe

The emergence of fintech arrived in Europe within a context of high financial development compared to other regions. This situation is reflected in Figure 2 where the financial development index³ shows that Europe is the global leader in the development of financial institutions and financial markets. (IMF, 2020)

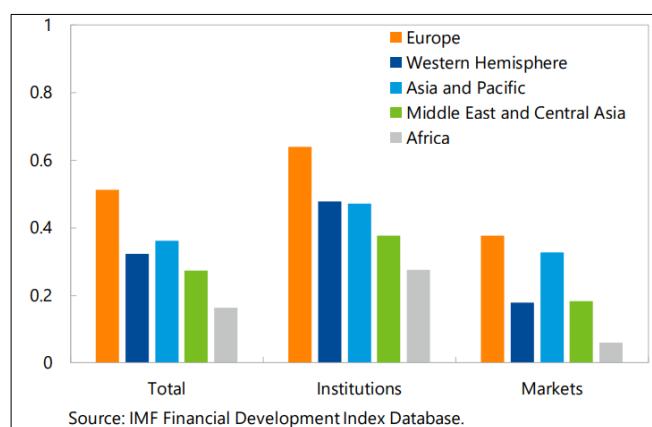


Figure 2. Financial Development Index (IMF, 2020)

However, the continent has not experienced the same growth in all the fintech sectors as is the case of the mobile money sector.

³ The index measures the development of financial institutions and financial markets in terms of their depth, access, and efficiency. (IMF, 2020)

As Figure 3 shows below, Europe is among the least developed regions in mobile money transactions followed by Western Hemisphere countries. Although mobile money transfers are not succeeding in the continent, digital payments are high. This sector has reached its goals due to the widespread internet usage in Europe in recent years.

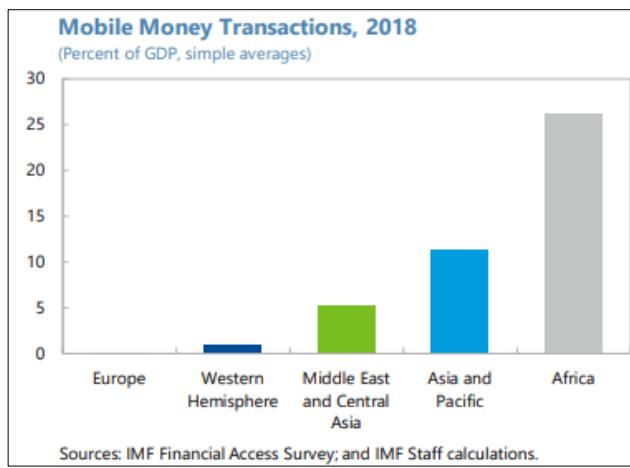


Figure 3. Mobile Money transactions (IMF, 2020)

Another important area to be analysed is the fintech lending sector. In the case of Europe, its share is really small compared with the dominant regions in the sector (China and USA). It accounts for 3% of global lending share where UK makes the highest contribution to Europe lending data. However, despite still having a low base in lending, the sector has increased 20 times from 2012 to 2017. (IMF, 2020)

In terms of bigtech companies, they are already operating in the European market, which is an important aspect because it means that the Fintech European sector is attractive and successful for such big companies to exploit the market.

The future of the European FinTech sector looks promising as there is still room for evolution, especially in the sectors of lending and mobile money transactions.

3.2 The Americas

In the second semester of 2021, America's FinTech investment reached \$105.3 billion with 2,660 deals as seen in Figure 4, while the previous year 2020 shows a record of just \$25 billion at mid-year. However, the highest investment in the Americas was during the third quarter of 2019, specifically in Mergers & Acquisitions activity⁴, although this was driven by lags in opaque private markets' data collection. (KPMG, 2020)

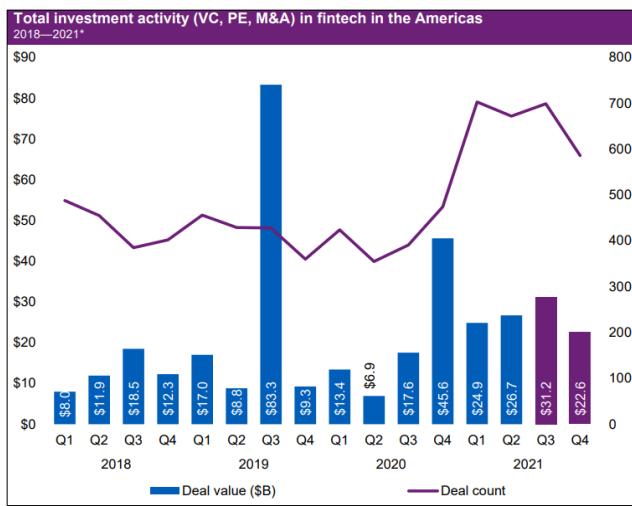


Figure 4. Total investment activity in Fintech in the Americas (KPMG, 2022)

As KPMG reports, the sector of digital banking and digital payments has strengthened during 2021. In the USA there was a high number of deals during this year and in Latin America investments raised, too. Another area that grew in the Americas during that year was the crypto space investments. The interest of the sector has been focused on crypto exchanges and crypto trading firms as well as start-ups offering support services for crypto firms. (KPMG, 2022)

As for the future, there are some relevant trends to watch in the following years. It is expected that deal sizes and investment in FinTech in Latin America will grow. In addition, the crypto space is expected to increase by the same time regulations in the sector do.

⁴ See in Annex “Figure 10. M&A activity in FinTech in the Americas (KPMG, 2022)”

3.3 Asia

Recently the Asian fintech market has become competitive and successful, making inroads in the industry with their innovative technologies. To understand the development of fintech firms in Asia it is important to highlight the global financial crisis of 2008. During that period, Asian banks resisted the detrimental effects of the economic crisis because of their low debt, stable macroeconomic factors and few linkages with the United States and Europe. As a result of their position advantage in the crisis, local Asian banks leveraged the situation to gain market share by replacing foreign banks affected by the crisis.

FinTech market penetration in Asia was led by the prior advances in developing countries. The growing demand in middle-class people for access to e-commerce made Asian banks realize that there was an important need to satisfy. Thereby, these local banks chose to partner with fintech companies as a form of reducing costs rather than competing against them. Therefore, fintech companies gained an entrance into the bank's market and banks stayed innovative thanks to the technology provided by FinTech and its big data access. (IFC, 2017)

The process was encouraged by Asian bank's regulations that supported FinTech's funding to small businesses and banks. In fact, the small and medium businesses account for more than 95% of businesses in Asia and contribute to more than a half of the employment. Therefore, government support with regulations that benefited SME enterprises has been an important factor for the growth of Asian FinTech sector. (ADBI, 2019)

Another important factor that helped the development of FinTech in Asia is the ample scope in emerging Asian countries, specifically southeast Asia, for exploiting fintech business compared to developed countries. As regional financial systems were underdeveloped, there was a lack of some services that now can be supplied by FinTech, and the results are substantially beneficial for Asian people.

For instance, FinTech has transformed smartphones into portable ATMs allowing clients to access basic financial services (online payments) without needing to be in a bank or ATM. This increase in mobile money transactions⁵ has improved the poor access to financial services. This issue of inaccessibility to banks is common in southeast Asian countries, Indonesia has 54.7 ATMs per 100,000 adults. (Iwasaki, 2018).

Furthermore, the development of FinTech in Asia has been powered by the growing availability to the Internet and smartphones in the region where previously penetration rates were very low. (Figure 5)

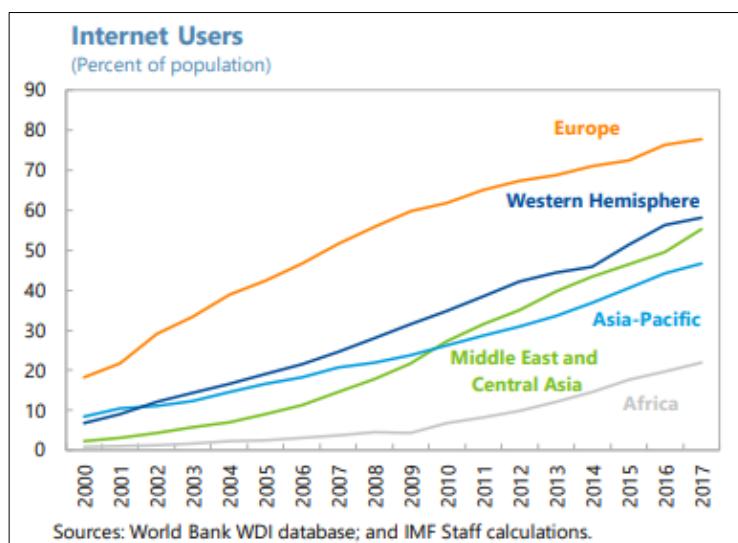


Figure 5. Internet users by continents (IMF, 2020)

In sum, it has been seen that Asian people is greatly adapting to these new technological services that FinTech offers. Plus, all the socio-economic factors that influence the living standards of Asian people have fostered the growth of the FinTech sector and it is expected that it will increase in the next years.

⁵ See Figure 3

3.4 Africa

The growth of the FinTech industry in Africa has been led by the African firm M-Pesa, which, for example, processed more than 6 million transactions in 2021 with a customer base of 30 million people. The success of the firm helped the FinTech industry to improve living standards and financial inclusion, especially in Sub-Saharan Africa, where bank penetration is less than 35%. (Yermack, 2018)

2021 was an important year for Africa's FinTech investment, reaching \$1.6bn with 153 deals, doubling the previous year record. The main markets in Africa are focused on Kenya in the East, Nigeria in the West and South Africa in the South. In the case of Nigeria its performance has stood out because of its number of deals. In the first quarter of 2021 they outstripped the total value of deals in 2020. Founding in Nigeria's investment has come mainly from US-based venture capitalist funds (over a third of its investment).

Not only Nigeria finds sources of funding in US venture capitalists, but the rest of Africa and part of Asia (especially China) finds it too. This foreign investment flooding in has awokened local investment funds to be more active. Despite coming late to the market, there are still many opportunities left to pursue. (KPMG, 2022)

The growth of fintech services in Africa has been fostered by the spread of smartphones across the continent. Mobile payments became more popular because of the inaccessibility to banks and ATMs, as African countries had poor infrastructure and low intergovernmental data connectivity. However, when smart phones became cheaper, mobile services started to rise in the continent as the 21st Century arrived. (IFC, 2017)

The main services are payments and transfers with foreign remittances in and out, and the latter have been accelerated by the pandemic. For instance, Zimbabwean people in South Africa used to take cash home crossing the border but this situation became difficult with the arrival of the pandemic and fuelled the money transfers through mobile phones.

At the same time, the sector of FinTech lending is currently at its growth stage in Africa. There is a great scope for improving the market, for instance in Nigeria credit penetration only takes 3% of lending in the economy. As the market matures, it is expected that other areas will develop too, as InsurTech and WealthTech. (KPMG, 2022)

However, in Africa fintech solution's development often depends on each country and niche markets. For instance, in the case of M-pesa its success took-off easily in Kenya while in South-Africa it did not. This is linked with the well-regulated banking sector in South Africa which is a high entry barrier for many fintech firms.

The future of FinTech in Africa looks promising as it is expected to continue growing as investors deploy their funds. However, there are two main challenges for the future. On the one hand, the lack of talent and skilled staff members for developing software and maintaining the services. The continent has a shortage in high-skilled engineers, but thanks to the pandemic situation employees can work remotely. African fintech firms hire their employees in the US or Europe, to develop their work remotely.

On the other hand, there exists a high concern about the present rise trend in interest rates in developed countries which are the main funding sources for African fintech companies. If the interest rates rise, then the available capital for Africa will be reduced. Overall, the outlook is positive for Africa and is likely that the FinTech market will grow in the forthcoming years. (IFC, 2017)

In conclusion, the international performance of FinTech has been highly differentiated between developed and developing countries, and among financial services too. Despite these evolution differences, the global future of FinTech looks promising, but it is expected that traditional financial institutions will be more affected as FinTech evolves in time. The banking sector is under significant pressure, and it should focus on improving its systems to generate customer experiences in the cloud as fintech companies do. This aspect will be discussed in further sections.

4. GLOBAL CONSEQUENCES FOR BANKING INSTITUTIONS

The recent development of FinTech not only has affected differently in geographical terms, but also has affected differently among financial institutions. During the next two sections, the analysis will be focused on the effects of FinTech on banks. These institutions have been highly affected with the arrival of these new technological services that have put pressure on their services and business model.

The challenge of being digital and regulated at the same time perfectly defines the current situation in the banking sector. Digital transformation is changing the financial industry and financial institutions like banks need to adapt to the new technologies and trends to remain competitive in a market in transformation.

A PwC report in 2019 relates digitalization and regulation. It explains the current challenge for banks, which is no longer to be digital or not, but to know how to be digital in a highly regulated environment. For that purpose, it is important to distinguish between the two main competitors for banks in the digital race: Fintech and BigTech.

In terms of competition, FinTech have a competitive advantage in some profitable financial services explained below, while BigTech benefit from their experience and big size compared to FinTech. The aim of this section is to describe the main advantages of FinTech against banking institutions and observe how the latter are adapting to the current performance of fintech and bigtech companies.

4.1 Causes for FinTech success against banks

The banking system's value chain has been affected by the emergence of FinTech. Furthermore, according to a survey made by PwC in 2017 it is claimed that FinTech services can take over 24% of banks earnings, which reflects the power of these companies in the financial sector.

However, digital financial services were already in the market when FinTech arrived. In fact, the first online bank in the U.S. was founded in 1994, therefore FinTech success does not come from an unknown or non-exploited market. (Stulz, 2019)

Nonetheless, fintech companies do offer some services that banks did not offer before, such as the case of cryptocurrencies. These digital currencies are disrupting the financial world because they do not need an intermediary, which is the main function of banks, to verify the transaction, and this opens the gate to a cost saving benefit for fintech companies. (Vives, 2017)

Apart from the new crypto space, fintech firms have more competitive advantages that have affected banking systems. The main digital utilities that had an effect on banks so far are new payment methods, lending platforms and financial advising platforms (Stulz, 2019);

- Mobile-based payment methods: financial services transactions that come from nonbanks. Its impact has been large, especially in developing countries because of the inaccessibility to a bank, as commented in the last section.
- Peer-to-peer platforms: lending technological services that match borrowers and lenders directly to provide credit without needing bank intermediation.
- Robo-advisors: computer programs that generate investment and financial advising according to the information they have about customers. Normal banking advisors appear to have some conflicts of interests in this type of services. Therefore, fintech companies benefit from the impartiality of these digital advisors.

In addition, fintech firms benefit from their business model which is highly different from banks. Since fintech companies' creation does not require a pre-existing infrastructure, these firms face no sunk costs. The implementation of digital technologies can be done without a huge capital investment.

Another important factor that enables fintech firms to move faster in innovation compared to banks is that they have larger economies of scale. This means that the cost of one more customer is not important enough for the firms, while banks are more rigid. Furthermore, regulation requirements are lower for fintech firms compared to banks.

All these aspects together are challenging the business model and historical background of banks. The question these institutions need to answer now is what is worth and which strategy is better, to collaborate or to compete with FinTech, taking into account the problems that may arise, such as regulation consequences or customer protection.

4.2 Strategies adopted by banks: threat or opportunity?

In general terms, banks have adopted two different strategies to confront this situation. On one hand, some banks have decided to collaborate with fintech companies as an opportunity to increase their benefits. On the other hand, some banks have seen it as a threat and they are now competing against FinTech while making changes in their current business models.

Penry Price, vice president of Marketing Solutions in LinkedIn, summarizes this situation perfectly; “fintech firms are finding success with a customer-centric focus that fills in gaps left by traditional firms. These gaps opened the doors to fintech firms, but trust in traditional firms remains important to customers” With this uncertain environment, banks need to consider what is best for their reputation and profitability. (Capgemini, 2018)

The first strategy is that some banking institutions see the situation as a win-win opportunity for creating a partnership with fintech start-ups. It may not be the priority solution for banks, but it would solve some issues they are facing like adapting its business to the digital world and to the technological lifestyle.

In fact, the World Fintech Report 2018 highlights that more than 90% of fintech firm's competitive advantage is their agility towards change and development of new products. (Capgemini, 2018)

Since 2017 the collaboration between both kinds of institutions has become a real solution. According to a survey by PwC, 45% of banks are already collaborating with fintech companies. (PwC, 2017) (Figure 6)

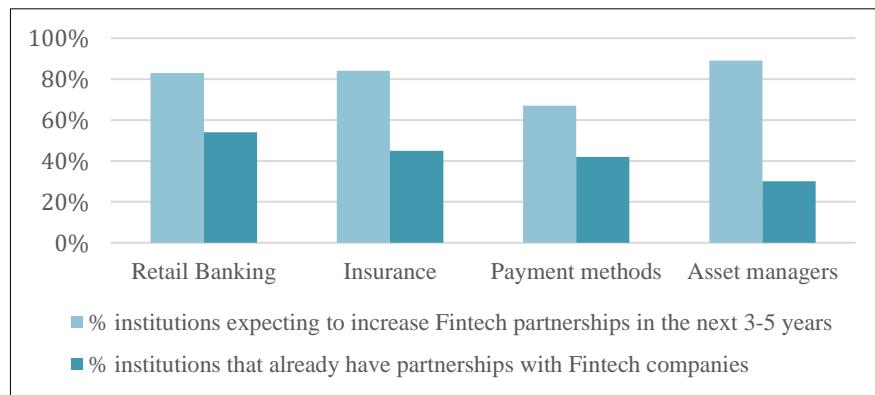


Figure 6. Alliances between traditional financial institutions and FinTech (PwC, 2017)

The most common alliances are for retail banking services with 54% of the surveyed companies doing so, and for insurance services with 42%. First, retail bank partnerships are a good form of broadening bank's product portfolio and it is expected to have a return on investment of 20%. Second, collaboration in the insurance sector is increasing and it is expected to have a return on investment of 13% (PwC, 2017)

An example of a retail bank which collaborates with fintech companies for different purposes is Santander Bank. This institution collaborates with Ripple for blockchain services, with SIGFIG for asset management services, with PayKep and myCheck for payment services, and with Kabbage for loan services. (García, 2017)

However, to obtain an effective partnership ecosystem is not as easy as it seems. Both institutions need to collaborate and redefine their path to success in order to exploit all their strengths to meet customer needs. (Capgemini, 2018)

This difficulty, among others, is why some banks have decided not to partner with FinTech as they have seen the situation as a threat to their business. Other difficulties that these digital companies face are cybersecurity concerns and customer privacy breach, which keep banks away from collaborating with FinTech. (PwC, 2021)

As a result, some traditional financial institutions have decided to turn the situation around and adopt the second strategy, which is to enhance their strengths to overcome the digital threat. Traditional banks are better prepared than these financial technology companies in some important fields such as risk experience, building trust to customers, regulatory management, and accessibility to capital. (BBVA, 2018)

An example of a situation where banks have adapted their business to compete against FinTech is regarding the payment methods that fintech companies offer. According to PwC in 2017, 84% of households confirmed that they used these services. As a result, banks are creating independent digital payment tools structured to appeal to those consumers. Another example is that the banking system is using regulatory sandboxes⁶ to have a competitive advantage towards fintech companies in the technological risks that digital services incur, and which are of concern to consumers. (PwC, 2021)

To sum up, banks have adapted to the current situation of digital banking changes with different strategies. Some institutions have decided to partner with those fintech companies to benefit from their success whereas others have strengthened their competitive advantages to compete against FinTech. However, there is no good or bad interaction between both institutions because the future of FinTech is unknown, and it is difficult to estimate how these relationships between banks and fintech companies will continue in the next years.

⁶ Regulatory sandbox: safe space in which businesses can test innovative products, services, business models and delivery mechanisms without immediately incurring all the normal regulatory consequences (Leckenby, 2021)

4.3 Banks and BigTech

The presence of BigTech in finance has also affected the banking system and has fostered the digitalization of the financial services in the last decade. In fact, the pandemic situation has affected positively their performance by increasing in 38% the market capitalization of BigTech companies in 2020. (PwC, 2021)

To better understand how it has affected the financial industry, first it is observed that some factors have driven these companies to operate in financial markets. (BIS, 2019)

- Access to data: the main advantage of bigtech firms is their accessibility to a wide customer data. This information provides the firm with an advantage in finance, for example in knowing how to assess to creditworthiness of borrowers and whether to lower costs of the intermediation process or not.
- Technological advance: bigtech firms have a large experience in technologies like machine learning and artificial intelligence which result in improved processes in finance. For example, they are able to better manage the data with their superior technology which results in lower costs.
- Lack of regulation: regulatory framework may change by country, but in general terms it is observed that financial regulation when entering the sector is not the same for bigtech firms. Not incurring in costs when entering the market is attractive for challenger banks - intermediaries - like these technological giants.

Driven by these causes, bigtech firms' penetration in the market has been a success. In 2019 the Bank for International Settlement estimated large differences in the market capitalization of the services offered by technology companies and financial groups. (Figure 7).

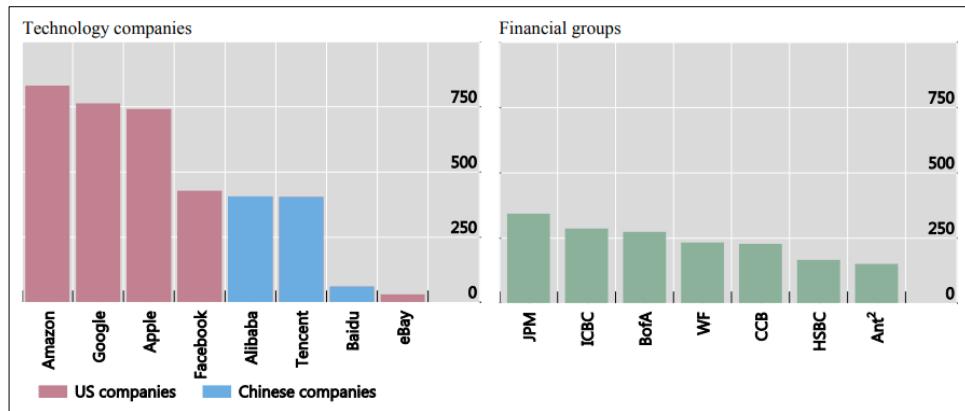


Figure 7. Market capitalisation of major financial groups and bigtech firms (BIS, 2019)

Despite the fact that financial activities are only a small part of the the BigTech's business, this data shows that technological companies are attracting more capital than traditional financial institutions. This advantage has been achieved not only by the financial services but mainly thanks to the other services offered by BigTech. (BIS, 2019)

The Financial Stability Board in 2019 estimated that BigTech have interacted with banks in two different forms: direct competition or partnership.

On the one hand, direct competition benefits these technology giants because they have lower costs for meeting the needs of consumers and higher gains from acquiring new consumers. In addition, this competition is bigger in emerging economies where financial services are still in the development phase and both competitors fight for leadership.

On the other hand, partnership generally benefits both institutions equally. Bigtech firms gain risk management and infrastructure services whereas financial institutions gain data analytics, cloud computing and processing and access to a big database of customers.

A good example of a collaboration is the case of Apple and Goldman Sachs. In 2019 they partnered to create the Apple Card which is a virtual credit card used in the payment application of Apple. (Tanda, 2019)

In addition, bigtech firms especially benefit from partnering with licensed banks because in that way they avoid accepting deposits and being subject to financial regulations. For instance, Amazon's lending service by the Bank of America Merrill Lynch, which already supplied 3 billion dollars in loans in 2016. (Tanda, 2019)

To sum up the global effects of fintech and bigtech services in financial institutions two important factors need to be pointed out. First, strategies adopted by banks are still in their early stage and in the future some new forms of interaction between banks and fintech firms may appear. Second, technological giants have arrived in the market as powerful competitors for both kind of institutions, banks and fintech companies.

5. FINTECH IN THE SPANISH FINANCIAL SECTOR

The Spanish FinTech sector has increasingly evolved during this decade, with more than 300 fintech firms operating in the market today. As Funcas reports in Figure 8, currently in Spain there exists almost one firm per 100,000 households, really close to the European average. (Carbó, 2021)

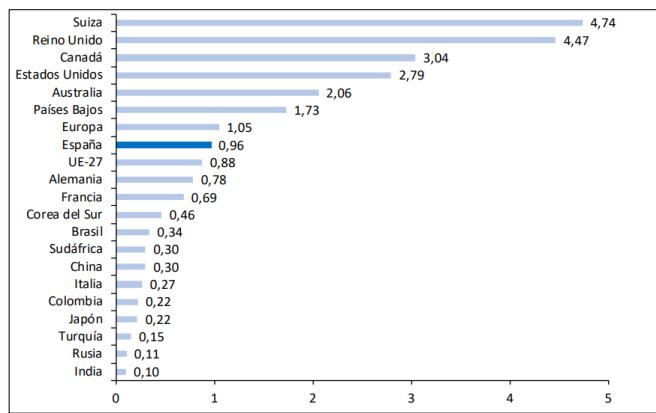


Figure 8. Number of fintech firms per 100,000 households (Carbó, 2021)

The exponential increase in the sector is found not only in the number of firms but also in investment terms. In 2019, fintech firms obtained 192,9 million euros in private investment. This increase of fintech firms and investment has paid off with a rise in the demand for fintech services in Spain. (Carbó, Cuadros y Rodríguez, 2020)

Therefore, in order to satisfy the new needs of Spanish households, fintech companies in the country have created a wide range of financial services offered in the market. Currently we can find eleven⁷ types of fintech firm's services operating in the Spanish economy. Specially, the biggest segment in Spain's FinTech sector is credit and loans, followed by new payments methods and investments services.

⁷ Credits/loans, new payment methods, investment services, tax and accounting, financial products distribution, currencies, personal finances, crowdfunding, neobanks, and export financing. (Carbó, Cuadros y Rodríguez, 2020)

This growth in demand for fintech services in Spain has been caused by the recent digitalization of Spanish households. Currently, 95.4% of Spanish households have access to the internet and 66.6% of them have used an electronic bank service in the last 3 months of the previous year⁸.

However, if we take into account global information of each country, it is seen that Spain is below the average in the percentage of people using fintech services⁹. (Carbó, 2021)

Despite these differences, the Spanish FinTech sector is evolving in a good direction towards a digital economy which has been fostered by the pandemic situation. This is reflected in the preferred payment methods by Spanish households. Since the pandemic, people have used less cash and substitute it by online payment methods. In fact, the percentage of people using cash post pandemic has been half of the percentage before the pandemic. (Figure 9)

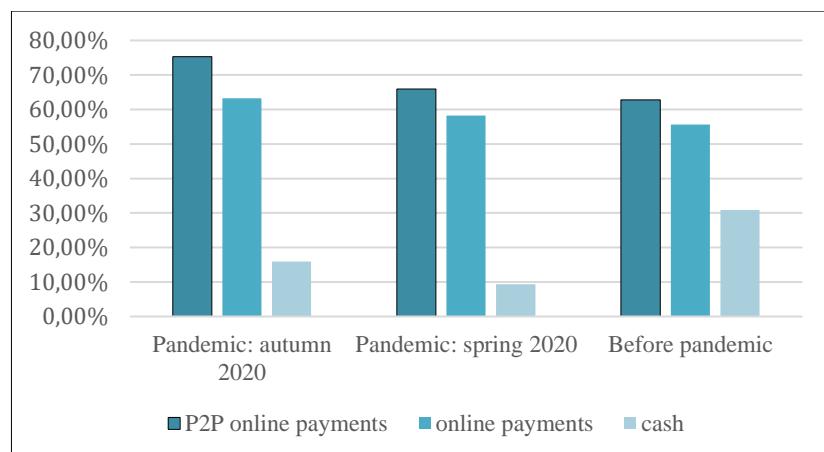


Figure 9. Preferences for payment methods before and after pandemic (Carbó, 2021)

⁸ See in Annex “Figure 11. Digitalization of households and access to internet (Carbó, 2021)”

⁹ The top countries measured by this index are India, China and South Africa which have more underbanked people that need fintech services to overcome the lack of banking services, thus increasing the percentage of people using fintech services in their country. See in Annex “Figure 12. Percentage of people using Fintech services (Carbó, 2021)”

In addition, people using P2P online payment methods have increased too after the pandemic from a 62.79% to a 75.26%. This new way of payment between people has revolutionized the Spanish socio-economic lifestyle. A common example in Spain is the platform *Bizum* which can be used to divide the bill of a restaurant. (Carbó, 2021)

To sum up, it has been shown that the country has experienced a rapid digitalization in the last years fostered by the pandemic. In the following sections, it will be seen how banks are responding to these changes in the financial sector and how they are affected by the arrival of bigtech companies in Spain.

5.1 Response of banking institutions

Banking system strategies have changed since FinTech success started to gain relevance in the sector after the financial crisis of 2008. During this time, banks and fintech companies interacted in a direct competitive environment. Nonetheless, both kinds of institutions realized that it was easier to cooperate with each other because of the possible advantages gained.

Funcas has researched about how the Spanish banking system is cooperating with FinTech, then the following explanation will be based on that report. (Carbó, 2021). Banks are currently interacting with fintech companies in *coopetition*. This term is defined by Boucken and Gast (2015) as “the interorganizational relationship that combines cooperation and competition”. As a result, banks and fintech companies create value through their cooperation while they compete to catch some of this value created.

In the Spanish sector, both institutions are coopeting in two different ways or business models.

- Collaboration through innovation facilitators: some banks have created accelerators to foster the growth of fintech projects which are starting in the market. These accelerators work as a hub of digital innovation for some start-up fintech projects which collaborate with the bank.

Therefore, the bank selects some fintech companies that are at its early stage and through a strategic plan, the bank accelerates the moment where the start-up begins to earn money.

In Spain there exists some famous accelerator banks focused on fintech startups. The most famous is Insomnia by Bankia, currently managed by Caixa Bank, which is the first accelerator company for fintech start-ups in Spain. Bankia selected the most profitable and talented fintech start-ups through a strategic process. As a result, Bankia worked with these companies in order to accelerate its returns and create profitable companies, so Bankia could collaborate with them in the future. (Cea, 2018)

- Investments: some banks actively invest in fintech companies through a portion of the company's shares of its capital. A well-known example of a high return of a bank investment in FinTech is the case of BBVA investing in Coinbase.

Coinbase was created in 2012 and today is one of the biggest platforms to sell and buy bitcoins. BBVA made the highest investment in 2015 in the company because "Coinbase touches on the most important aspects of this emerging ecosystem" says Jay Reinmand, director of BBVA Ventures at that moment. BBVA saw it as an opportunity to enter into the new technologies and applications that are changing the financial environment. (BBVA, 2022)

5.2 BigTech in Spain

The arrival of BigTech into the economy has affected the financial institutions of different countries globally, including Spain. The entry in the financial business of these companies benefits from some advantages, such as low costs of intermediation and innovation as a differentiation aspect that empower them in the market. Due to their power to be direct competitors of banking institutions, bigtech companies need to have an effective strategy whether they compete or collaborate with them. (Gorjón, 2021)

In Spain, some bigtech companies like Apple, Google or Samsung have interacted with banking institutions in different ways as can be seen in the table below. (Carbó, 2021)

Table 1. Alliances of BigTech and financial institutions in Spain (Carbó, 2021)

	Traditional bank	Neobank	Fintech
Google Pay	21	11	8
Apple Pay	30	13	9
Samsung Pay	20	1	-

First of all, Apple Pay is the leader in the alliances with traditional banks. Thanks to this collaboration, banks allow clients to pay through the applications that BigTech offer. Secondly, some Neobanks collaborate with bigtech firms for payments. For example, Revolut or N26 clients can pay through Apple Pay, Google Pay or Samsung Pay instead of using the application of the neobank. Lastly, some Fintech companies such as Aplazame collaborate with BigTech.

Therefore, bigtech companies have a cooperative behaviour towards their performance in the Spanish market by collaborating with different financial. This strategy is also observed in FinTech interaction with banks in Spain, with the coopetition style such through innovation facilitators or investments. To sum up, it can be said that Spanish financial institutions are currently adapting their business to the new technological platforms, and it is expected that new forms of collaboration may appear.

The last two sections have shown that the emergence of FinTech is changing the financial industry and banking institutions have been the most affected by the new technological services. Banks need to keep adapting to the new technological environment taking into account the different challenges and risks that the digital sector face. Fintech companies can face the same kind of challenges, so the next sections will deal with the main issues regarding the future of the FinTech sector.

6. CHALLENGES AND RISKS IN THE FUTURE OF FINTECH

Among the main challenges and risks, some financial institutions have reported that fintech companies should be concerned about cybersecurity, regulation, and privacy in the services offered. (PwC, 2017)

The purpose of this section is to discuss the future of the FinTech industry and will be based on a report of Lee and Shin in 2018 that summarizes the main possible challenges and risks that these companies could face in the financial landscape.

- Customer management: fintech companies face a big challenge in acquiring and retaining customers in their business. In general terms, there are more fintech companies specialized in a type of service rather than offering various services at the same time. For that reason, people may use different fintech companies for different services. For instance, PayPal for paying online and Bizum to divide the import of a bill. Therefore, these fintech companies need to offer the best service in their niche to be able to retain the maximum number of customers.
- Regulation: fintech companies must be aware of how regulation may impact their innovations. Regulatory requirements may differ depending on the type of service provided such as capital requirement or anti-money laundering.

Regulation is a risk for fintech companies since new activities offered by them sometimes are not covered yet by regulation and FinTech don't know which requirements they will face. (FSB, 2017)

However, sometimes FinTech benefit from the lack of regulation in services where banking institutions face more strict guidelines in the same service. This is the case for lending, fintech peer-to-peer lending firms don't have high regulations since it's not technically lending, whereas banks face complex regulations.

- Security and privacy: the adoption of new technologies can bring with them problems such as cyber-attacks or misleading cybersecurity. An example of the latter is the case of Dwolla, a fintech company that misled its customers about the security they received with its services. For that reason, companies need to develop appropriate security and measures that ensure consumer data protection.

If cybersecurity is incorporated in its early stage, then cyber risk should be more mitigated. Furthermore, this strategy becomes even more important, as more different financial institutions collaborate with each other, because cyber hackers have more points to target. (FSB, 2017)

- Risk management: there are many risks that fintech companies are facing, but the most important are financial risk and technological risk.

On the one hand, financial risk may vary on the type of service offered and the problems that can arise from it. For example, in a fintech company that offers loans or mortgages the counterparty risk may arise because the other parties don't comply with their obligations. In that case, a FinTech would have more difficulties to mitigate the risk than a big bank because of its scarcity of capital.

On the other hand, technological risk may arise because of some lack of control in these digital services. A good example are robo-advisors, which have important responsibilities due to the possibility of failure in their financial algorithm. Therefore, dependency on technology for doing business often rises problems which are difficult to manage.

In conclusion, these innovative services need to be aware of the regulatory framework, security compliance needs and customer privacy management to offer the best service in the industry. The importance of controlling possible risks in the business of FinTech also increases when the latter wants to attract banking institutions to collaborate with them. Furthermore, it is important to keep up with modern technologies to reduce the possible problems of technological failure.

7. CONCLUSIONS AND LIMITATIONS

The digitalization of the financial sector has been accelerated by the emergence of fintech companies and its growth has been fostered by the pandemic. This situation has changed our socio-economic habits, and companies have taken advantage of it to satisfy the high demand for digital channels in the financial sector. The adoption of new technological tools and innovative services of financial sector has been a success and this intensification of digital demand have resulted in new interactions between financial institutions. In this section some conclusions on the topic will be discussed as well as the limitations that have appeared in the development of the study.

The first general conclusion obtained is that the development of the FinTech industry has not been equal in every continent or country. Specifically, it has been found that developed and developing countries are not experiencing the same evolution in the adoption of technologies. On the one hand, developed countries have a higher bank penetration rate and higher capital funds than developing ones. These fintech companies in developed countries may supply fewer mobile transactions but in services like lending or cryptocurrencies their performance stands out.

On the other hand, fintech companies' penetration has been better in developing countries like Africa or Asia where there is a broader scope to satisfy financial needs because of the difficulty for households in these continents to access banks. This is reflected in the number of mobile money transactions made, where emerging countries are on the top. In addition, these countries are now attracting capital investment from developed countries (e.g., USA). However, obtaining data for the different countries in developed and developing zones has been a limitation in the study since many researchers have generalized the performance in each zone without taking a deeper look into the differences among countries.

A second general conclusion is that fintech companies have also affected the financial institutions in different ways, and the effects are especially relevant for the banking sector. Throughout the years, banks have managed to find a good position in the financial market without powerful competitors that could change their business model and take part of their profits. Nowadays, the arrival of FinTech is disrupting the financial industry which affects their good and experienced position in the sector. For example, fintech companies are gaining advantage in some financial services such as P2P platforms, Robo advisors or new mobile payment methods. Furthermore, these companies benefit from other advantages in their business model such as their large economies of scale, no sunk costs and facility of adoption of new technologies.

Faced with the arrival of these new digital services, banks have adopted different strategies to respond to the threat of fintech companies, which is the third general conclusion. Collaboration between both kinds of institutions is an opportunity for increasing benefits and broadening the financial services that can be supplied. Some financial institutions have opted for this strategy, especially retail banks and insurance companies. In addition, a partnership is also likely to occur with other technology companies like BigTech because banks will gain better advantages like huge customer databases and big infrastructures, which fintech companies don't have.

However, other banks have been more threatened by the risks that could arise from partnering with a fintech company such as regulatory challenges and customer privacy breaches. These banks have decided to compete against fintech companies by enhancing their strengths and creating their independent digital financial services.

As a specific conclusion it has been observed that in Spain, a trend of collaboration is appealing to banks which is commonly referred to as "coopetition". This strategy can be carried out through facilitators of innovation, in a way that banks accelerate the development of fintech start-ups for a later collaboration with them, or through investments in these start-ups.

A limitation that has appeared in the research of banks' responses is the scarcity of articles where the responses of banks are not to collaborate or to compete, but instead mix cases such as the coopetition style cases in Spain. This has made it difficult to find other examples at the global level.

Lastly, a fourth general conclusion obtained is that the risks that fintech companies may encounter because of the digital environment need to be controlled. Specifically, the security compliance which is an aspect that concerns clients, such as customer privacy management. In addition, the FinTech sector must be aware of regulation compliance which also affects the institutions that may want to collaborate with them. The main limitation found in this aspect is that the literature used does not cover the fact that technological failure is implied in these risks, which means that some challenges that fintech companies face cannot be controlled at all.

In general, the paper has covered all the objectives set at the beginning of the project. It has been possible to answer the questions of, which financial institutions have been more affected by FinTech, in which financial services FinTech have succeeded, and which technological institutions are also innovating in the financial market. It is believed that this paper could have some public utility for future research of financial institutions on financial development.

Finally from my point of view, it can be concluded that strategies adopted by banks regarding FinTech represent some of the changes these institutions are experiencing in their business models in order to not fall behind because of digitalization. However, this new technological relationship between banks and clients should not imply that the human element disappears in banking. Specially for clients, having a centralized institution that controls their services is important and digitalization doesn't need to be applied to all aspects in the business. Furthermore, financial exclusion is an aspect to take into consideration when developing these new digital tools since not every household can adapt with the same facility. For the future, addressing changes in financial services towards a digital era will ensure that banks, among other traditional financial institutions will not lose the value they have built up over the years.

8. ANNEX

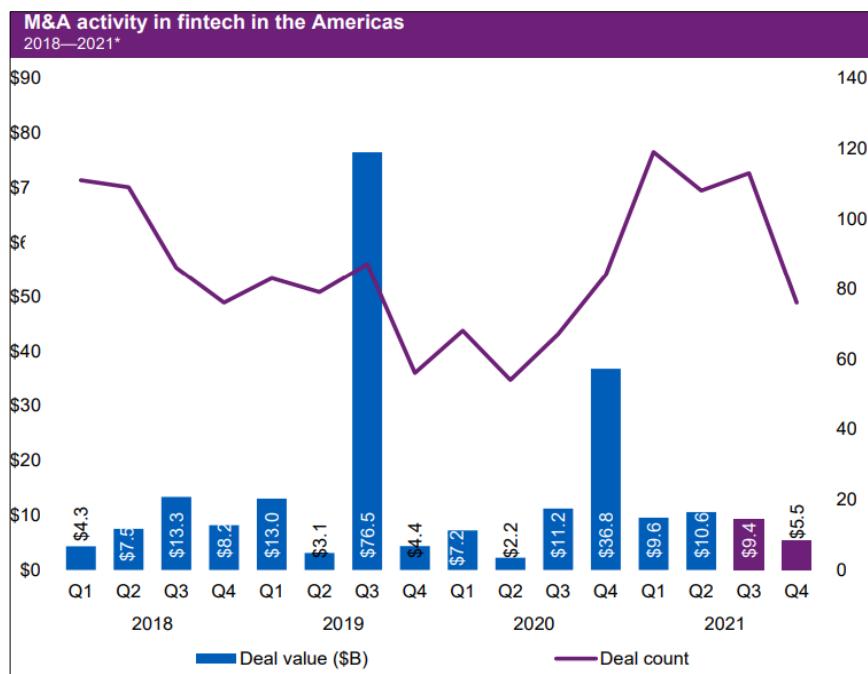


Figure 10. M&A activity in FinTech in the Americas (KPMG, 2022)

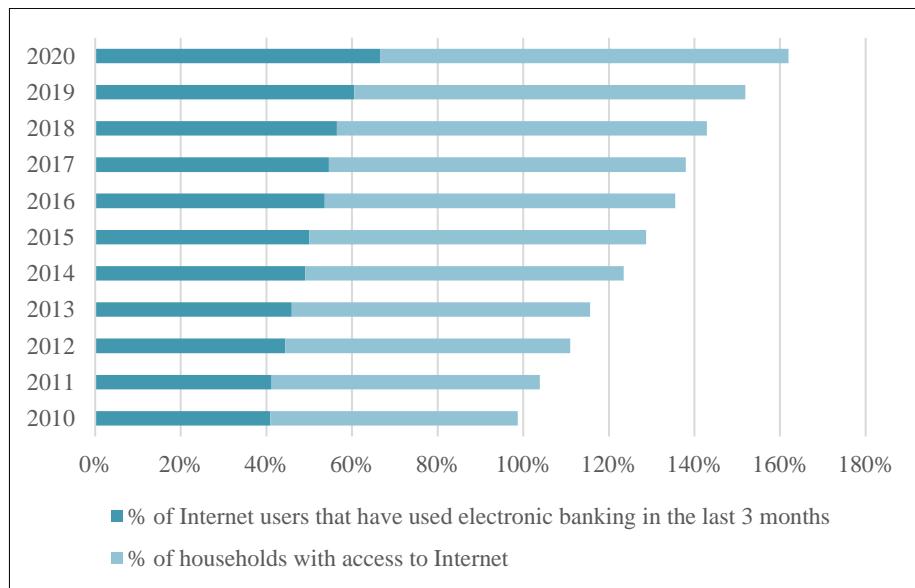


Figure 11. Digitalization of households and access to internet (Carbó, 2021)

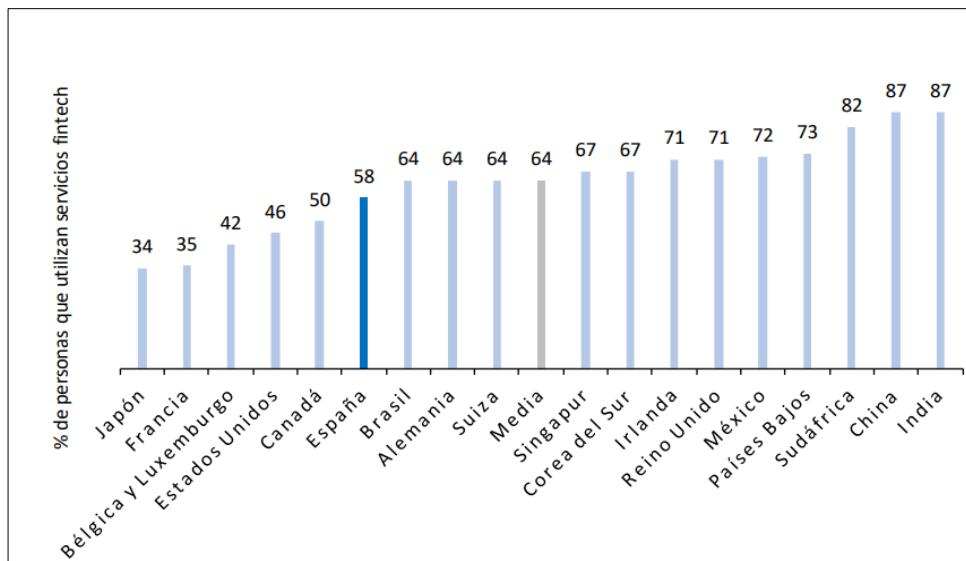


Figure 12. Percentage of people using fintech services (Carbó, 2021)

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