

Future Banking Scenarios. Evolution of Digitalisation in Spanish Banking

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Submitted: 27 August 2019, accepted: 15 February 2020, published: 19 February 2020

Abstract: The banking sector has begun a process of digital transformation that is changing the way financial products and services are sold. This transformation is a consequence of the growing demand for digital channels by some sectors of the population, the progress of new technologies and the banks' need to improve efficiency after the economic crisis. The emergence of innovative financial technology (fintech) startups in the banking sector has been the lever initiating this digital transformation. Technology companies are challenging established banking business models and promoting the democratisation of finance in a more efficient and transparent financial ecosystem. Increasing investment in these technology companies has also attracted the interest of various regulators, and the future suggests a scenario of collaboration between these new players and traditional companies, with a consequently difficult task for the regulators of guaranteeing the same conditions of competition for new entrants and incumbents. However, technology companies with vast experience in the gathering and use of data from millions of users (such as Amazon, Google or Facebook) are considered a threat. Moreover, some types of evolving fintechs, such as neobanks with bank licences, may also become competitors. Distributed ledger technology (DLT) or blockchain, a fintech technology that is evolving constantly, has already awoken the interest of all financial sector participants because it could trigger real disruption and produce a new era of value.

Keywords: digital banking; fintech; regtech; distributed ledger technology (DLT); blockchain; neobanks; payment services directive (PSD2)

JEL Classification: G1; G2

How to cite: Silvia Valero, Francisco Climent, Rafael Esteban. Future Banking Scenarios. Evolution of Digitalisation in Spanish Banking. *J. Bus. Account. Financ. Perspect.*, 2020, 2(2): 13; doi:[10.35995/jbafp2020013](https://doi.org/10.35995/jbafp2020013).

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1. Introduction

Recent changes in the provision of financial services have been perceived as a consequence of the banking sector's need to improve its efficiency after the crisis, a result of the growth in computing capacity, the digitalisation of almost every area of economic activity (the fourth industrial revolution) and the low (or non-existent) cost of mass data storage. Moreover, there is a growing demand for alternative channels, as an increasing number of citizens and companies want efficient, intuitive and mobile access to à la carte banking services.

These trends have caused the emergence of new players and software applications that have been decomposing and reconfiguring the services traditionally organised around consolidated regulatory entities, such as universal banking or investment companies. Regulation, which is still scarce and incipient for new companies, has always been an entry barrier that protected against the intrusion of new banking competitors.

The emergence of new technology companies can be perceived as a threat to traditional banks, as it could lead to the loss of some of their profits and role as central conversational partners with customers in terms of their financial life. This emergence can also be seen as an opportunity for renewal (either through in-house development or through alliances with new technology companies) and to get greater operational flexibility, technological capacity, expanded digital culture, and entrepreneurship. As a consequence, traditional banks are changing their current business models and debating whether to buy these innovative technology companies, collaborate with them or develop in-house technology.

Banks are afraid of technology giants such as Google, Apple or Amazon because of their formidable access to consumer data. However, the large amount of data and detailed knowledge that financial institutions accumulate from clients as harnessed by cognitive technologies may also represent a major opportunity for banks to lead the new digital era.

Regulators and supervisors are paying attention to the changes in the provision of financial services and studying the benefits they provide and the need to monitor their development. All of the regulatory principles in this area are liable to modification following the launch of business models and proposals from new companies.

Therefore, the financial crisis, together with the adoption of new technologies, is producing a major banking transformation.

According to [Maudos \(2017\)](#), the economic crisis had a negative impact on the Spanish banking system, as the following facts show:

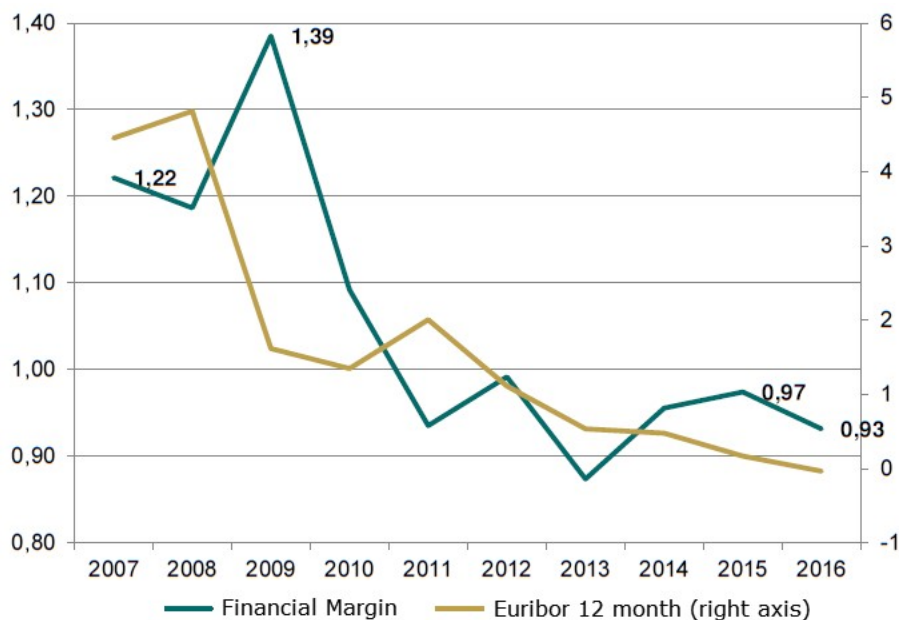
- €291 billion provisioned for restructuring since 2007—representing 26% of the 2016 gross domestic product (GDP);
- Capacity adjustment: with a reduction in the branch network by 37% and jobs by 29%;
- Net public aid (excluding estimated recoveries) received as capital of €60.6–39.5 billion from the Spanish Fund for Orderly Bank Restructuring (FROB in Spanish), in addition to €21.1 billion from the Spanish Deposit Guarantee Fund of Credit Institutions (FGD in Spanish);
- Application for financial assistance from European funds (€41 billion as well as a memorandum of understanding).

The restructuring, consolidation and capitalisation produced positive results, as profitability has recovered, defaults are falling and credit for new operations is increasing. However, despite the effort, there is a problem of viability for European banking: The return on equity was 5.2% in 2016 for consolidated groups and 2.8% for the domestic business, and this is less than the 8% to 10% required by investors (cost of capital) ([Maudos, 2017](#)).

The major challenge for the banking sector is to increase profitability in an unfavourable situation caused by several factors:

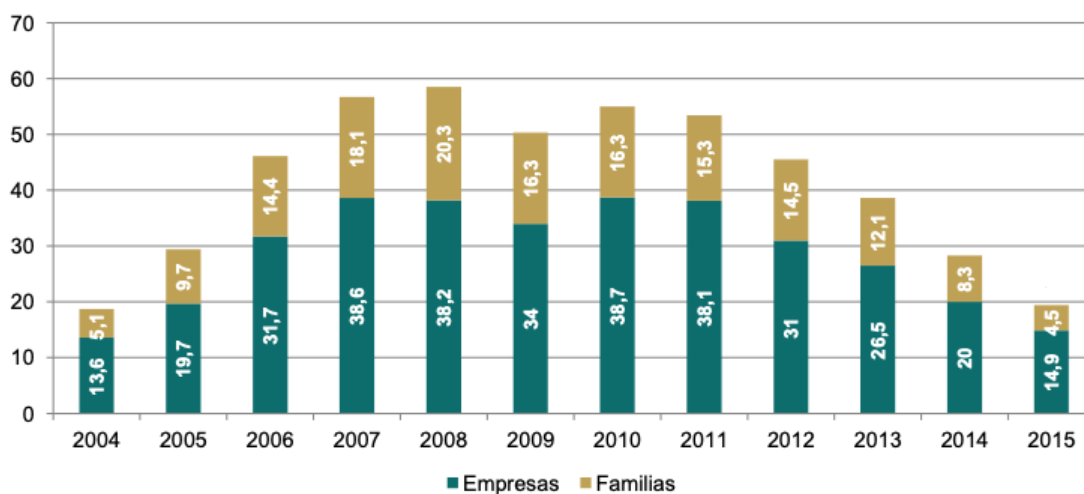
- (a) Low interest rates with the consequent decrease in financial margins (see [Chart 1](#));
- (b) High volume of problem assets. Although the volume of default credit has been reduced by 40% (€81 billion) since 2013, the volume of unproductive foreclosed property assets remains stable at approximately €80 billion;

- (c) Regulatory pressure. Despite enormous efforts for greater capitalisation (Spanish bank-owned resources increased by 51% since 2007, an increase of €73 billion to reach €216 billion), the solvency ratio of Spanish banks is still 2.7 percentage points below the European average;
- (d) Private sector deleveraging. Chart 2 shows that, despite private sector deleveraging (households, and especially companies), the private debt/GDP ratio is still much higher than the Eurozone average (19.4 pp in 2015), and so, deleveraging is expected to continue.



Fuente: BdE

Chart 1 Financial margin (percentage with respect to assets) and 1- month Euribor. Source: BdE in ‘Current situation of Spanish banking’, Maudos (2017).



Fuente: BdE

Chart 2 Private debt/gross domestic product (GDP). Difference in percentage points (pp) between Spain and the Eurozone. Source: BdE, in ‘Current situation of Spanish banking’, Maudos (2017).

An increasing number of large companies are accessing the Spanish Alternative Fixed-Income Market (MARF in Spanish) for finance. Furthermore, there is no increase in outstanding credit volumes because of the decline in mortgage lending (despite a consumer lending recovery).

According to [Maudos \(2017\)](#), the actions needed to improve bank profitability are:

1. Further reduction in installed capacity to improve efficiency. There is still room for reduction if the situation in Spain is compared with other EU nations. Spain has the smallest bank branches in the European Union, with an average of 6.3 employees, in contrast to 15.2 employees (EU28), and the proportion of inhabitants per office in Spain is one of the lowest (1493 vs. 2170) due to the existence of many branches;
2. Give more importance to fees in the total revenue structure. Bank fees in 2016 constituted 23% of total net business income in Spain. It is expected that bank fees will grow, while interest rates remain low;
3. Digitalisation. Digitalisation strategies can reduce the operational costs of banks. In addition, as will be described in the next section, in just six years (from 2010 to 2016), the number of people banking online increased by almost six million.

Digitisation will help banks to improve profitability. It is also important to emphasise that the intangible nature of financial products makes banking suitable for total digitisation.

The aim of this paper is to analyse the different factors that are stimulating the digitisation of the banking sector (such as the need of the banks to improve their efficiency after the economic crisis, and the advance of new technologies), as well as to describe the new players emerging in the sector. In addition, possible scenarios for the banking sector will be outlined (depending on how new players develop in the years ahead).

The article consists of three more sections. Section 2 analyses the current situation of digital banking. The following section studies the impact of new technology companies in the banking sector, as well as the new technologies that may revolutionise the sector. Finally, conclusions summarise the main results.

2. Current Situation

We firstly detail the reasons for the adoption of digital banking in Spain and then describe the irruption of financial technology firms—known as fintech—in the Spanish banking sector. In addition, the different categories of this new type of company are described, as well as the technological concepts that have been emerging in recent years.

According to [Arellano and García \(2017\)](#), data from the Survey on the Equipment and Use of Information and Communication Technologies in Households (ICT-H) reveal that the number of electronic banking users increased by 64.5% from 2010 and reached 15 million in 2016 (see [Chart 3](#)). This figure represents 38.9% of the total population and 53.4% of internet users, 15.4 and 12.5 percentage points more than in 2010, respectively. This double-digit growth has meant that the penetration rate of online banking in Spain has almost reached the European average, although it still stood 8 points below in 2016 (see [Chart 4](#)).

Analysing the demand elements that have driven online banking and isolating the effect of each studied variable reveals the importance of education, digital skills, frequency of internet use, presence of ICT tools at home and age. Digital banking also grows with income level but decreases with age (from 34 years) and home size, and its use is more common among Spanish nationals and employed men.

Access to e-banking also grows with the population density of the place of residence of the user and is greatest in the north of the peninsula (Galicia, Asturias, Cantabria, Basque Country and Navarre), in the Balearic Islands, Madrid and Catalonia ([Arellano and García, 2017](#)). However, it is important to indicate that estimates suggest that the probability of using e-banking would have grown anyway—even if these demand variables had remained unchanged. It would have increased as a result of technological factors (new technologies) and the needs of the financial sector (improve efficiency).

[Arellano and García \(2017\)](#) emphasise that despite the notable diffusion of online banking, the electronic purchase of financial products is still scarce and incipient. The ICT-H for 2016 indicates that only 8 per cent of internet users performed online financial activities during the last year.

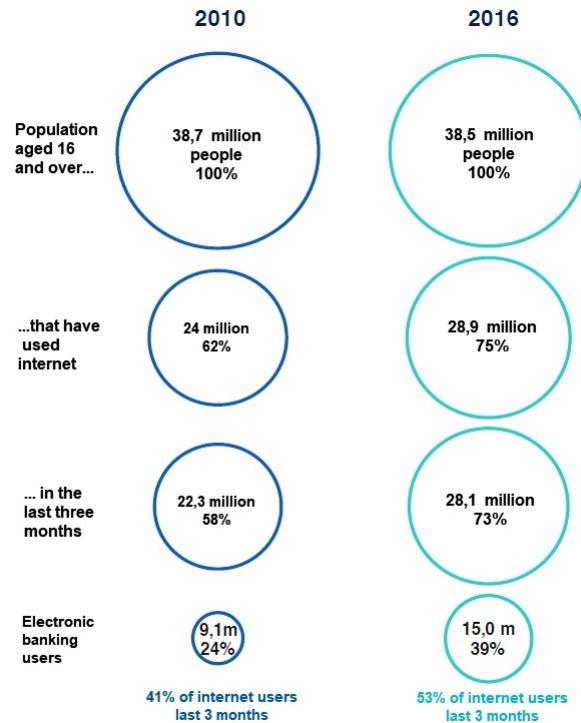


Chart 3 Adult population, internet users and users of electronic banking in Spain, 2010–2016. Source: BBVA Research from INE, in [Arellano and García \(2017\)](#).

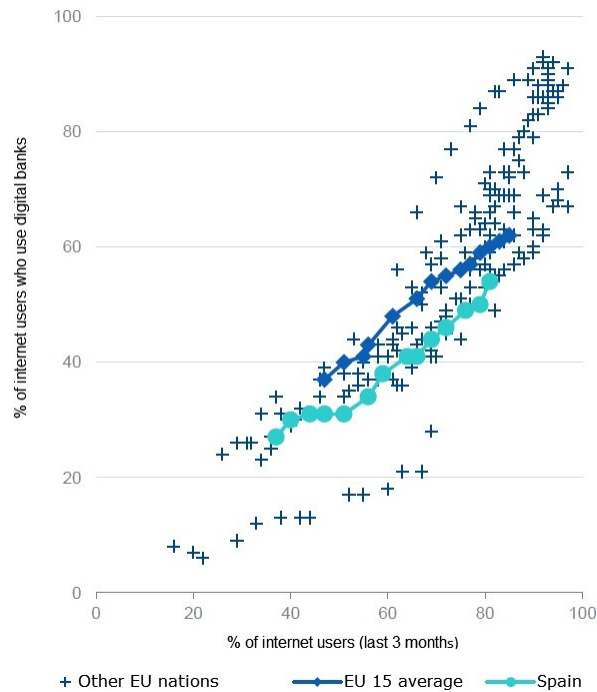


Chart 4 Internet users and users of electronic banking, in Europe, 2003–2016. Source: BBVA Research from INE and Eurostat, in [Arellano and García \(2017\)](#).

Chart 5 shows the distribution of individuals who have been online during the last 12 months and the financial activities they have carried out. Some 92.2% of internet users perform no financial activities online. Among those who purchase at least one product, half subscribed or renewed insurance policies, and a quarter bought or sold

financial assets. By contrast, only 16.7% of those who have performed online financial activities contracted from two or more product groups.

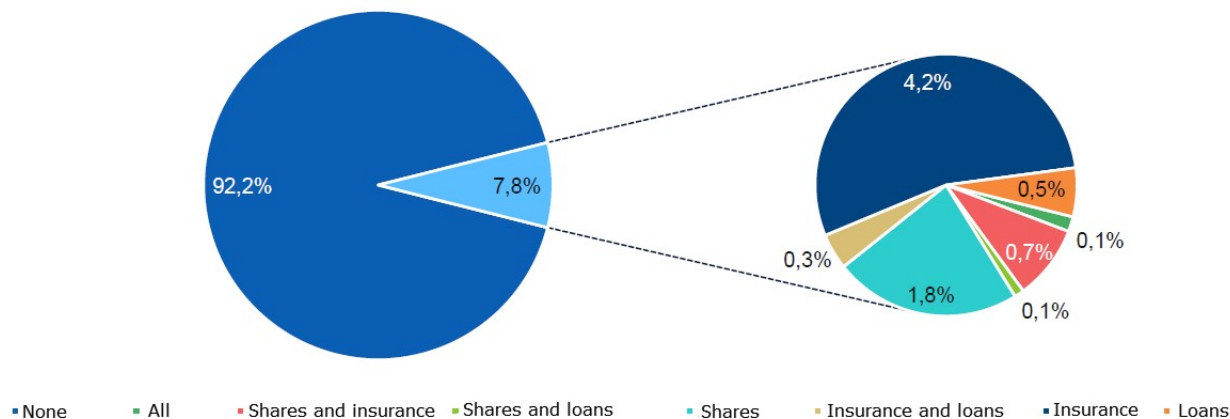


Chart 5 Distribution of the population that has been online in the last 12 months according to the financial activities carried out (internet users aged 16 or over, %). Source: BBVA Research from INE, in [Arellano and García \(2017\)](#).

Therefore, there is still considerable distance between online information searches and the online purchase of financial products. However, it is confirmed that the use of e-banking is a necessary condition for online contracting of financial products.

As in the case of online banking users, it is estimated that men with higher education and considerable familiarity with internet are the most likely to buy financial products online. This consumer is usually older than the average user of online banking, financially stable, foreign and living in a single-person household. The importance of trust is also emphasised: Individuals who declare themselves to be ‘very trusting’ on the internet are five points more likely to acquire financial products than those that claim to trust ‘little or not at all’ ([Arellano and García, 2017](#)).

The decision to perform online financial activities depends on the product. In the case of shares, bonds, funds or other investment products, the obtained results are qualitatively similar to those indicated for the aggregate. Regarding subscriptions or insurance policy renewals, the importance of age stands out. Unlike other activities, the probability of contracting insurance online grows uninterruptedly with age. Finally, it is observed that the personal and family characteristics of the respondent do not affect the probability of agreeing a loan online, with the exception of age and education level ([Arellano and García, 2017](#)).

Therefore, we can conclude that e-banking in Spain has grown in popularity over the last decade, and the number of users has increased by 64.5% since 2010. Despite this, few users buy financial products online.

2.1. Irruption of Fintech

According to [García-Ochoa and Puente \(2017\)](#), fintech is the set of financial innovations that produce new business models, applications, processes or products that have an effect on financial markets and institutions and the provision of financial services.

Fintech companies, which are usually startups with a strong technological component, have entered a world of highly consolidated entities (credit institutions, insurance companies and investment service companies), whose business implies high fixed costs and which, therefore, lacks the efficiency of a fintech startup.

These startups are the main drivers of digital transformation, as they challenge the products and services that banks offer. The development of information and communication technologies is driven by the more efficient, faster and personalised provision of financial services.

In the fintech world, we can find companies that unbundle a bank (see [Illustration 1](#)), that is, financial technology startups which claim to compete in some areas of traditional banking (monoliners); and other companies

which claim to compete in all, or almost all, areas. In the first case, each fintech focuses on a specific banking product or service. Its value proposition is an improvement on the traditional bank offer, through lower costs and/or better quality of user experience, while in the second case, integrated banking services are offered. This second option is materialised through players, known as ‘neobanks’, who have recently appeared in the sector, or through acquisition and/or collaboration between specialised fintechs.



Illustration 1 The unbundling of a bank. Spanish FinTech Map (may-17). Source: <http://spanishfintech.net/mapa-fintech-espana/>.

Both types of fintech are facing a challenge. For those focussed on a single product or service, it is difficult to offer a value proposition sufficiently attractive to consumers, and therefore, their business model is weak (some may have a large base of customers, but their income could be low).

For fintechs that develop a broader value proposition, the difficulty lies in creating an offer of financial products/services that is profitable and wide enough to attract a large customer base. In addition, many of these fintechs use a ‘freemium’ model, or a completely free model in many cases, and this makes it more difficult to build a cost-effective business.

According to [Noya \(2016\)](#), fintechs are quick in leveraging technological innovations to offer user-centric banking products optimised for digital channels at a low cost or with a better customer experience. This global acceleration in financial services innovation has several causes:

- **Fintech startups are finding funding from venture capital:** Fintech companies received investments during 2015 of approximately \$22 billion, 75% more than the previous year (see [Chart 6](#)). Funding increased 10% in 2016, to almost \$24 billion. China made the largest investment of about \$10 billion, which represents 90% of Pacific Asian investment in the fintech sector.

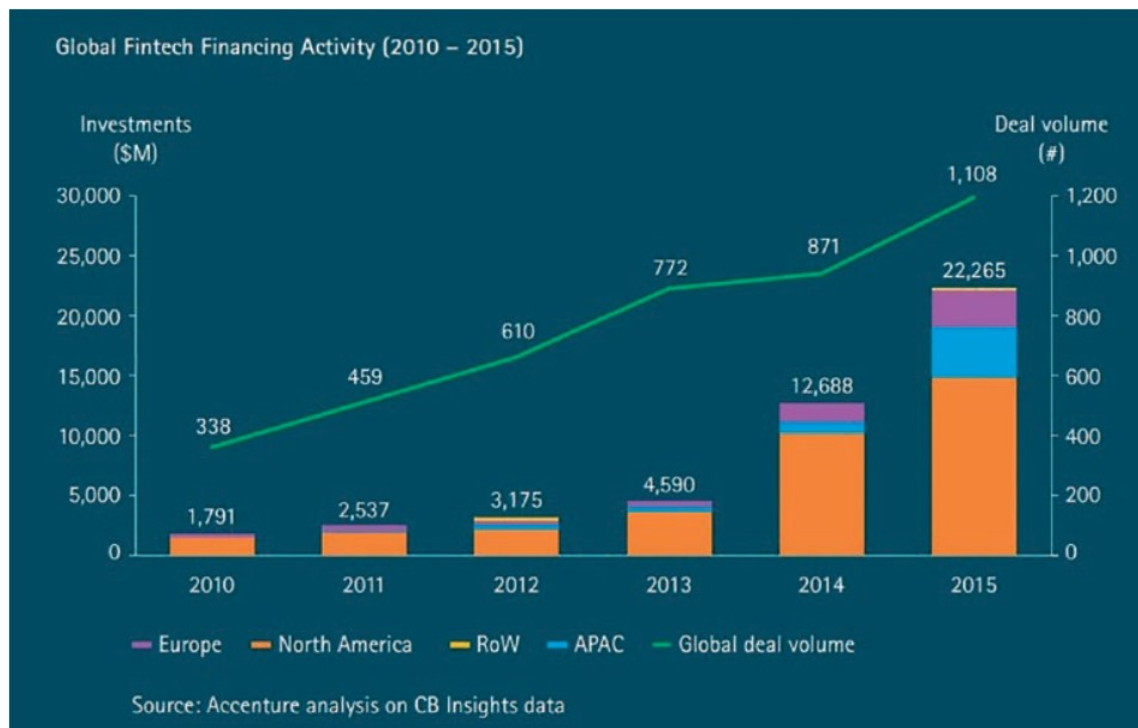


Chart 6 Investment volume in fintechs. Source: Accenture, in [García-Ochoa and Puente \(2017\)](#).

[García de la Cruz \(2017\)](#) indicates that although the United States has pioneered this type of company, Europe, headed by United Kingdom, has followed very closely. However, in recent months, Asia has become the largest region in terms of the number of initiatives and their size, being the largest attraction pole of investment worldwide.

- Discomfort with traditional banking: Since the 2007 crisis, public distrust of the banking sector has continued to grow;
- Perception that new needs or changes in technology, devices and the preferences of new generations (millennials) for accessing information are not being addressed properly;
- Digitisation is everywhere: Rapid growth of mobile phones and the digitisation of numerous aspects of our daily lives enable new forms of communication and interaction that were previously impossible to implement and/or impossible to justify in terms of cost;

- Globalisation: According to Pellicer (2016), ‘Fintech is born in no-man’s land and by definition is a global company.’ For example, there are companies founded by Spaniards with head offices in London and offices throughout Europe. This is the case of Ebury, which has its head office in London, with offices in Madrid, Malaga, Amsterdam and Warsaw. SpotCap is based in Berlin, but its first market is Spain, and Flywire has offices in Boston and Valencia.

The global soul of these types of companies has meant the arrival of foreign companies in Spain, so Spanish companies are not only competing with each other.

Approximately 15,000 companies make up the fintech sector worldwide, with 265 companies in Spain (June 2017)—as can be seen in Illustration 1.

At present, these new players must overcome fewer regulatory compliance obstacles than banks. They are also free from the ties of legacy systems, which in banks cause major economic and management complexity costs (Noya, 2016).

It is important to note that the investment and ecosystem created for this type of business can vary widely from one country to another (see Charts 7 and 8). According to Pellicer (2016), Salvador García, CEO of Ebury (a company specialising in foreign exchange and international trade): ‘In London there is access to capital and knowledge. There are funds that understand the operation and needs of technological companies, and this favours success stories. Spanish venture capital invests in proven business models in other nations, but not in Spain.’

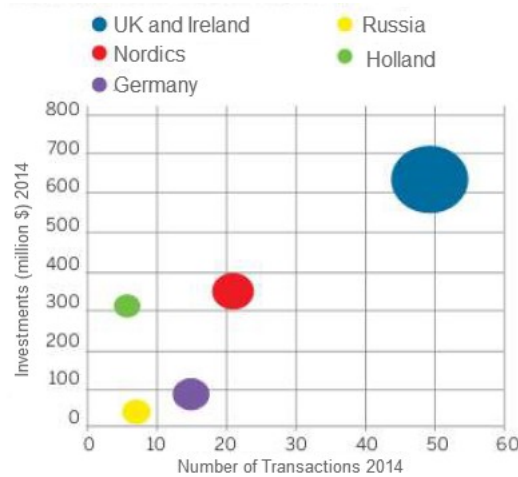


Chart 7 The five largest European regions for investments in fintech.

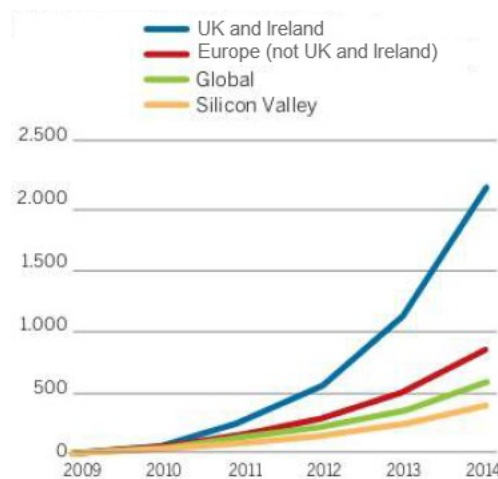


Chart 8 Growth of investment in fintech in the last five years. Source: IEB and Accenture.

The fintech world can be classified into the groups shown in Table 1.

Group	Subgroup	Examples
ALTERNATIVE FINANCE	Crowdlending to companies (<i>P2B lending</i>)	Funding Circle, Auxmoney, MarketInvoice and LoanBook
ALTERNATIVE FINANCE DIGITAL PAYMENTS	Crowdlending to individuals (<i>P2P lending</i>)	Lending Club, Prosper, Ratesetter and Zopa
	Equity Crowdfunding	Crowdcube, Seedrs and AngelList
	Balance-sheet lending	OnDeck, Kabbage, Spotcap and Wanna
	Transfers (<i>remittances</i>)	TransferWise, USForex, CurrencyFair, peerTransfer and Azimo
DIGITAL PAYMENTS ACCOUNT and INVESTMENT MANAGEMENT	Efficiency in e-commerce payments	Klarna and Square
	Foreign Exchange (FX)	Kantox, HiFX, FairFX, Ebury and Flywire
	Payments through mobile phone	Apple Pay, Samsung Pay, Android Pay, MasterPass, Vodafone Wallet and Bizum
	Personal finance	Mint, HelloDigit and Level Fintonic, Mooverang
ACCOUNT and INVESTMENT MANAGEMENT	Investments	eToro, Robinhood and DriveWealth
DISTRIBUTED LEDGER TECHNOLOGY (DLT) or BLOCKCHAIN	Automated financial advice (<i>robo-advisors</i>)	Schwab IP, Wealthfront and Betterment
	Alternative currencies	Bitcoin, litecoin and peercoin
DISTRIBUTED LEDGER TECHNOLOGY (DLT) or BLOCKCHAIN BANKING INFRASTRUCTURE	Core-banking infrastructure	Blockchain, Ripple and Ethereum
	Core banking	Mambu, Musoni
BANKING INFRASTRUCTURE NEOBANKS	Onboarding	Trulioo, Onfido
	Other (API-based banking, identity, authentication, etc.)	Pich, Unmax, Icar
	Neobanks with banking licence	N26, Atom
NEOBANKS DATA ANALYTICS	Neobanks without banking licence	Moven, Simple, BlueBird, Fidor and Hello ImaginBank (CaixaBank)
	Alternative risk models	Aire, Cignifi, Lenddo
Other TECH	Regtech: regulation + technology	Ayasdi, Global Blockchain Labs Engagement (IBM), Onfido, Silicon Valley Bank, Suade and Sybenetix
Other TECH	Insurtech: From the insurance sector	Lemonade and Zhong An Rastreator, ebroker, medtep, Bajo LLave and MyZUUM
	Proptech: Real-estate CrowdInvesting	Zoopla, easyProperty and PurpleBricks
	And more: Healthtech, Adtech, Wealthtech, etc.	

Table 1 World fintech classification. Source: Prepared by authors from Table 2 of Noya (2016) and García de la Cruz (2017).

Most fintech companies work on digital payments, followed by those specialised in loans, financial aggregators and crowdlending. In addition, almost half of these companies offer services exclusively for end consumers (Pellicer, 2016).

In the following subsections are described the various classes of fintech.

2.1.1. Alternative Finance

The alternative financial sector has been highly dynamic and has had a considerable impact in the media, since it competes with traditional banking in intermediation, loan granting and collecting deposits. Some models try to improve on the traditional credit origination process through digitisation, automation, data analytics and machine learning technologies that enable credit decisions to be made online and almost in real time.

Other alternative finance models break down this intermediation and put lenders and borrowers in direct contact. These models are based on creating platforms, or markets, in which multiple investors find a return on investment in assets that until very recently were unattainable for the retail investor. For example, business-to-business lending (B2B lending) platforms offer corporate loans funded by multiple investors, and the P2P (peer-to-peer lending) ones work in a similar manner to private loans. Crowdfunding or participatory financing platforms (PFP) are the most successful approach to date and consist of pooling all types of resources (ideas, material and immaterial goods, and funds) by a number of people interested in the success of a specific project (García-Ochoa and Puente, 2017). However, attracting sufficient finance to service all the loan demand has been difficult for these latter models. To obtain the necessary funding, most supplement their P2P funding sources with bank funding.

2.1.2. Digital Payments

Digital payments are replacing or modifying traditional payment methods. PayPal, an e-commerce company whose system enables users to make online payments and transfers without sharing financial information with the recipient, is the veteran fintech in this sector.

Smartphones have also led to the spread of methods such as mobile payment, wallet, or virtual cards, which are replacing cash payments or physical (plastic) cards.

Fintech startups in this category seek to introduce greater cost efficiency and transparency, from international credit to card payments, making e-commerce transactions more efficient or increasing transparency in currency exchange costs.

The struggle for cost efficiency is leading to new proposals with virtually no margins. The attraction of investing in digital payments lies in the subsequent analysis of the data they generate. That is, digital payments are a new source of information that enables fintech startups and banks to calculate customer risk with greater precision.

Crowds of innovative and small fintechs, as well as large and well-known technological companies, are struggling to establish themselves in the world of digital payments. For example, the Bizum platform,¹ owned by 27 banks, faces mobile payment competition from several fronts: mobile manufacturers (Samsung Pay or Apple Pay); operators (Vodafone Wallet); payment experts (MasterPass); and internet giants (Android Pay).

2.1.3. New Nontraditional Sources of Information and Alternative Risk Models

Historically, traditional risk models have been limited in their ability to predict customer solvency due to limitations when incorporating new sources of nontraditional information. This is accentuated in developing countries, where a large part of the population has no access to basic financial services. The main negative consequences for consumers are:

- Inability to access basic financial services and, therefore, difficulty prospering economically;
- Payment of excessive prices (for example, loans with abusive interest rates);
- Inability to recover from setbacks or errors (for example, negative credit spirals).

¹Bizum (2017).

New nontraditional sources of information are emerging following the application of new technologies (for example, the digitalisation of payments, as previously mentioned, is generating transactional information that was not previously available), and several startups are taking advantage of these new sources of information, together with new analytical technologies, to develop alternative credit models that enable estimating customer solvency. These models complement traditional models instead of replacing them.

As an example, several fintech startups (for example, Clip, iZettle and Square) are developing cheap digital versions of POS (point of sale), so that small businesses can accept card payments. This helps businesses to digitise cash flows and provides large amounts of transactional information that enables an analysis of personal and business risks that could not previously be achieved (for example, thin-files).

2.1.4. Account and Investments Management

Some startups in this sector, such as Fintonic,² have developed technologies that make it possible to easily and quickly aggregate all the information contained in a client's bank accounts. As described by Noya (2016), their goal is to help people to gain greater control over their personal finances.

Other startups have created algorithms to advise on the best investments for given risk profiles, as well as saving and consumption patterns. In comparison with traditional banks that only provide information about their products, startups have flourished that facilitate access to wider information in a simpler and more visual form. Automated financial advice can be highlighted in this area through so-called 'robo-advisors', who are online advisors managing asset portfolios with minimal human intervention. They use algorithms based on modern portfolio theory (as used by expert financial advisors). These products offer middle-class investors the professional management expertise to which only the richest clients previously enjoyed access.

The target audience of automated advisory systems are younger generations, attracted by greater transparency and lower prices than traditional management modalities, and sometimes higher returns.

In general, a properly developed technology can produce predictions and repetitive behaviours more accurately than a professional. In addition, access to detailed and up-to-date information is quick, and consumers can access it from anywhere at any time. However, automated financial advice can also carry risks for consumers. Without proper regulation, as seen below, financial institutions can use automated advisory algorithms to capture consumer information and use it to their advantage (García-Ochoa and Puente, 2017).

2.1.5. Banking Infrastructure

The fintechs discussed in this area develop solutions that help traditional banks to modernise their technology and internal processes in areas such as: core-banking systems; identification and authentication applications; or customer onboarding technologies—including 'know your customer' procedures (KYC) or 'anti-money laundering' (AML) solutions.

One of the greatest challenges that traditional banking faces is modernising its core-banking systems, which have become obsolete, expensive to maintain and inflexible and have difficulties integrating with external agents. To address this problem, new fintech companies (for example, Mambu) are developing easy-to-update, lightweight, reliable, API-based core-banking systems.

Other fintechs (for example, Onfido and Socure) are improving the customer onboarding process so that customers experience much less bureaucracy and lower management costs when accessing financial services. At the same time, banks can manage onboarding in a remote, automatic, cheap and efficient manner.

²(Fintonic, 2017).

2.1.6. Distributed Ledger Technology (DLT)

Distributed ledger technology is an electronic trading record comparable to an accounting book. Originally, it emerged as a technological base (in this case known as blockchain) for the Bitcoin cryptocurrency and enables machine-to-machine payments without intermediaries (bank, Visa or MasterCard).

The disruptive nature of this technology is that it enables moving from a centralised to a decentralised model. In other words, its maintenance corresponds to a network of participants, called nodes, instead of a central entity, so there is no central validation system. From time to time, newly accepted operations form a block which is added to the previous chain of operations and is published to the other network nodes (García-Ochoa and Puente, 2017).

Information is transparent, that is, anybody can check the traceability of any transaction and know where the money is at any time, and from any computer within the network; but, at the same time, everything is encrypted with the security measures necessary to ensure that such information is protected and cannot be altered.

DLT can be applied in several areas. Some of its financial applications include speeding and reducing the cost of payments and transfers (such as the American startup Abra). Nasdaq, for example, already uses Blockchain technology. Further, it can also be used in decentralised forecasting markets, where Augur, for example, enables buying and selling shares by anticipating a situation based on the probability of an event occurring.

The true potential of this technology, and what attracts both investors and banks, is its ability to develop applications that facilitate depositing and transmitting value digitally in a decentralised and secure manner.

2.1.7. Neobanks

This neologism is one of the latest additions to fintech jargon. While the previous fintech groups specialise in an area, product, or banking service, that is, they generate added value by focusing on a particular activity (such as improving a bank's attractiveness by offering a lower cost and/or a better user experience), a neobank is defined as an all-digital bank that aims to satisfy the basic financial needs of most people.

According to Martín (2016), neobanks do not require sophisticated financial products. They focus on providing a simple and intuitive customer experience, using digital channels, with an important focus on mobile users. Consequently, their objective demographic profile is mainly young people (millennials), since they are more willing to work with a remote provider.

Neobanks currently focus their offer on current account holders, debit or prepaid cardholders and individuals making money transfers—and also offer various support tools for managing personal finance. In addition, they respect values in the digital environment such as control over privacy and commissions (non-existent in many cases) structure transparency. With this approach, they pursue a closer relationship with customers, which in turn enables them to know their customers better and offer them the most relevant services.

Martín (2016) also points out that neobanks, compared to traditional banks, enjoy the advantage of not having a complex technological legacy with difficult-to-exploit data structures. Neobanks also enjoy the cost savings of not having a physical distribution network. However, neobanks usually have a very limited range of products and must win the trust of customers from scratch (with the exception of those neobanks backed by one or more traditional banks).

Neobanks are not always 'banks' (understood as financial entities with their own banking licence which are subject to strict regulation and supervision). We can classify neobanks into different subgroups (see Illustration 2).

To streamline the process for Neobanks created from scratch and to increase competition, the British financial authorities (the Financial Conduct Agency and Prudential Regulation Authority) have been pioneers in simplifying the process for obtaining a bank licence by lowering capital requirements and lengthening the deadline to reach the Basel III levels. This initiative aims to cut the time required to obtain a licence from two years to six months.

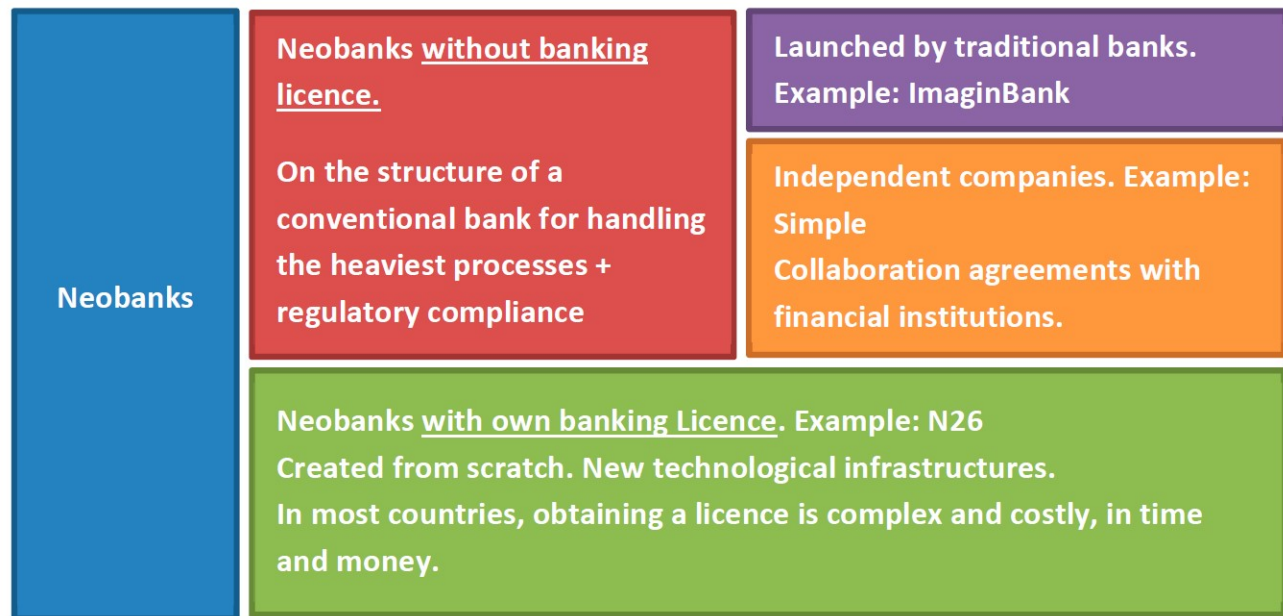


Illustration 2 Neobank classification. Source: Prepared by authors based on information from [Martín \(2016\)](#).

We will have to wait to see if other countries follow this British initiative, but these new entities will surely emerge in the markets. In addition, neobanks operate simultaneously in several European markets as the integration of the single banking market progresses ([Martín, 2016](#)).

According to [Noya \(2016\)](#), one of the most frequent discussions in the fintech community is whether neobanks are creating a new banking paradigm that will have the same disruptive effect on banking as Amazon had on the retail trade and book distribution. Until now, no neobank has ‘stolen’ hundreds of thousands of customers from traditional banks, but there is no doubt that significant changes are occurring in consumer behaviour that could lead to real disruption in the years ahead.

2.1.8. Regtech

Regtech (regulatory technology) refers to a set of companies and solutions that combine technology and regulations to help to address regulatory requirements in all sectors. In the financial sector, they are considered an area of fintech ([Fernández Espinosa, 2016](#)).

Compliance with regulatory requirements is, in terms of costs and resources, one of the biggest burdens that financial institutions face. The simplification of this task through the use of technology is not new, as entities are currently using technological tools and hiring specialist technology companies to comply with regulatory requirements.

Regtech is an emerging trend, and there is no closed definition nor a history to confirm its possible benefits. However, regtech companies focus on proposals to improve the agility, flexibility, speed and accuracy of information, such as:

- Big data: real-time processing, large-scale data storage and integration of heterogeneous and textual data;
- Data mining tools and advanced analysis: There is a growing range of automated learning, computational statistics, complex algorithms and statistical physics (e.g., deep learning) that provide better simulation techniques for decision making;
- Software integration tools: ready-to-use accounting and compliance tools that interact directly with regulatory information systems;
- Platforms and networks open to sharing data, format standards and common processes;
- Data clouds that enable cutting costs and implementation times;

- Blockchain;
- Visualisation tools: Regulators need powerful tools for visualisation, comprehension and reporting of heterogeneous data sources without the need for extensive programming experience;
- Biometric and social media analysis, such as KYC procedures;
- Real-time, integrated risk assessment/compliance tools that improve operational efficiency and effectiveness across multiple domains;
- Predictive coding, which seeks to identify patterns of activity, such as unusual communications, and nonroutine office output patterns. In short, patterns that may indicate suspicious behaviour (BBVA, 2016a).

Interest in this type of business is growing because financial regulation has undergone a process of major change since the global financial crisis, and regulatory requirements for financial institutions are increasing.

The focus on risk prevention makes requirements increasingly complex. Thus, banks must meet the requirements of multiple regulatory entities, and requirements change rapidly, while regulators require access to a growing volume of data to ensure compliance. For financial institutions, addressing these regulatory requirements is very laborious, complex and costly. According to the Institute of International Finance (IIF), costs may exceed one billion dollars a year. A McKinsey consultant found that fines and regulatory sanctions for 20 large American and European universal banks grew by 45% between 2010–2014. It is estimated that around 10%–15% of the workforce in financial institutions is dedicated to governance, risk management and compliance (BBVA, 2016a).

The main problems facing banks are compliance costs, dependence on manual processes in data management and other traditional problems related to data quality, such as accuracy, lack of common definitions or variety of formats. The volume of data produced by financial institutions is increasing, and regulators demand access to analyse systemic risks and the behaviour of agents in the financial ecosystem.

Because the challenge is how financial institutions can address compliance effectively and with minimal resource consumption (but improving the quality of the data they present to supervisors), many regtech companies are focusing on the automation of manual processes and the links between analysis/reporting processes, improving data quality, creating a comprehensive view of data, automating data analysis using applications capable of learning during the process and the generation of regulatory reports that can also be used internally to improve decision making (BBVA, 2016a).

Regtech is attracting the interest of regulators, central banks, commercial banks and risk compliance and regulatory compliance firms. Due to its potential to improve the relationship between regulators and financial institutions, there are currently two initiatives led by the British Financial Conduct Authority and the IIF to encourage the growth of these companies as an important element in the development of an efficient financial ecosystem. Regtech can be a game changer for all parties. In fact, according to a recent PwC study, 87% of CEOs in the banking sector view regulatory changes as a source of disruption. All business areas affected by regulation and regulatory compliance are candidates for regtech solutions, for example, international fiscal rules for strengthening fiscal transparency, international accounting standards and liquidity risk management. Antilaundersing and antiterrorist financing (ALD–CFT) regulations are also an area with strong regulatory requirements, as well as advisory services and investor protection (BBVA, 2016a).

2.1.9. Incipient Regulation of Fintech Technologies

Although the fintech sector is still in development, the increase in investment in companies from this sector has attracted the interest of various national and international regulators, who have begun to study the advantages and risks of new fintech technologies and are formulating regulatory proposals to ensure an efficient and secure provision of financial services.

Regulators have focused on studying and making recommendations on four types of Fintech technology:

1. Crowdfunding platforms

The social purpose of these companies is to put in contact—through websites or other electronic methods—investors with people who want financing for a collaborative project. However, according to the European Securities and Markets Authority (ESMA), crowdfunding is considered a risk for money laundering and terrorist financing. The partial regulation of crowdfunding has crystallised in Spain with the promulgation of Act 5/2015 (27 April), regulating the promotion of business financing (*Ley de Fomento de la Financiación Empresarial*) for participative financing platforms (*Plataformas de Financiación Participativa* or PFP).

In addition to this, a PFP must have the authorisation of the National Securities Market Commission (*Comisión Nacional del Mercado de Valores* or CNMV) before starting activity (García-Ochoa and Puente, 2017).

2. Robo-advice

According to García-Ochoa and Puente (2017) the requirements for personal advising have been established. Basically, there should be a recommendation on specific financial instruments based on the personal circumstances of each investor. Generic and nonpersonalised recommendations are considered as commercial communications rather than personal advice.

Another aspect to take into account in this area is the impact of the transposition of the MiFID II Directive, planned for January 2018. This directive pays special attention to the training and experience of financial advisors and provides the requirements that must be met by the investment algorithms used to make investment recommendations.

Proportionality in the use of the data collected by organisations, together with a duty to respect user privacy, will be issues that legislators must deal with soon to ensure a reliable financial system (García-Ochoa and Puente, 2017).

3. Distributed ledger technology (DLT) or blockchain

Among the disadvantages detected by the ESMA is the current lack of jurisdictional and technical integration. Blockchain is based on an open model, but it is foreseeable that an authorisation system will be established, restricting access to authorised participants.

The European Banking Authority (EBA) has also analysed the impact DLT technology may have on electronic currencies. These currencies cause legislator concern due to their high volatility and possible connection with criminal activity. Thus, the European Central Bank (ECB) insists on the need to consider them as a ‘means of exchange’ rather than ‘means of payment’ (García-Ochoa and Puente, 2017).

4. Big data

According to García-Ochoa and Puente (2017), big data entities add value through data collection, management and intelligent analysis.

The main proposals to adapt current legislation to the needs of big data development are circumscribed to the adoption of uniform interpretive criteria for data protection regulations, so that they are aligned with technological advances.

It is necessary to update intellectual property legislation to extend its scope to fundamental concepts in big data, such as the algorithms used by robo-advisors. Big data is the base for the development of robo-advice platforms and other fintech innovations, and for this reason, regulation is vital.

In general, it is considered that there should not be an over-regulation of the Fintech sector, as this would imply an unnecessary bureaucratisation that would hinder its development.

Moreover, it is important to highlight the ‘White book on Fintech regulation in Spain’, which is an initiative of the Spanish Association of Fintech and Insurtech (AEFI, 2017) to specify a framework of ideas and proposals for regulatory changes that favour the business activity of Fintech operators in the Spanish financial sector. This association aims to make access to financial services increasingly efficient, accessible and transparent.

According to Pérez (2017), president of the AEFI, the work they are doing with institutions to create a certainty environment for fintech is causing some Spanish companies with London head offices return to Madrid (a decision that could be reinforced by Brexit).

3. Possible Digitalisation Scenarios for the Banking Industry

In this section, we analyse various digitalisation scenarios for the banking industry.

Fintech startups have become a real challenge to traditional banking. Incumbents are studying how to evolve and adapt themselves to the new wave of digital innovation. These incumbents believe themselves ready to face the challenge.

Incumbents unable to adapt to this new digital wave will likely lose business to competitors as clients start demanding new products and services. According to García de la Cruz (2017), 'it is difficult to give timeframes in a changing environment, but it is clear that the exponential technological evolution is accelerating change among consumers, and on what they demand from providers, especially their financial providers.'

Below, we study potential developments in the relationships between the traditional banking system and the fintech world, and the future role of these two players. We also consider other changes that may happen in the banking system as a consequence of digitalisation. However, before that, we explain a new European directive that will speed up the transformation of the industry, favouring those fintechs which create new and disruptive business models.

The first payments service directive (PSD) in 2007 aimed to create a single EU payment market, thus boosting innovation, competition and efficiency in Europe. PSD2, which is still pending transposition to Spanish legislation, develops the first PSD and expands its objectives (BBVA, 2016b).

According to Gómez (2017a), 'this directive establishes that banks in the Eurozone must provide client information to third parties, under certain circumstances and always with the explicit consent from clients. It is going to become, without a doubt, one of the most accelerating drivers for transformation in the financial sector.' Therefore, PSD2 reflects a positive approach from the European regulator to new service providers and aims to boost their development, which is in line with the spirit of the capital markets union and its objective of achieving a single digital market.

AEFI has worked on the final draft of its transposition because the eventual implementation is going to have a significant impact in the sector. A suboptimal transposition could slow down the growth of fintech in Europe.

This directive will affect fintech startups classified as payment service providers. According to García and Hermida (2017), security on payment initiation through PISP (payment initiation service providers) and on AISP (account information service providers) aggregation with direct access to accounts (see Illustration 3) will be essential.

Currently, when a purchase is made, the merchant must interact with a series of intermediaries, such as the electronic payment provider, who contact the client's credit/debit card issuer (e.g., Visa, Mastercard) and who finally charge the amount to the client's current account. However, with PISP, the consumer will be able to just authorise the merchant to execute payments in their name through the current account. The merchant and bank will communicate directly using a dedicated interface powered by the bank, typically an API (application programme interface).

According to García and Hermida (2017): 'PISP will bring security to payments by considering it a push action from the sender's account to the receiver's, rather than considering the payment as a pull action (as happens with debit cards today, where receivers ask for the money from the sender); and this eliminates and prevents the sharing of sensitive data in payment gateways, thus makes payments cleaner and without detours or intermediaries.'

New AISP providers will bring an enhanced user experience through more convenient tools, which will offer an aggregated view of the client's financial position. Furthermore, they will solve the security problem caused by current scrapping³ technologies.

³Technique to extract information from a website by simulating a user. As a consequence, users give their details, with the implied risk that this involves. This technique is prohibited, with some exceptions.

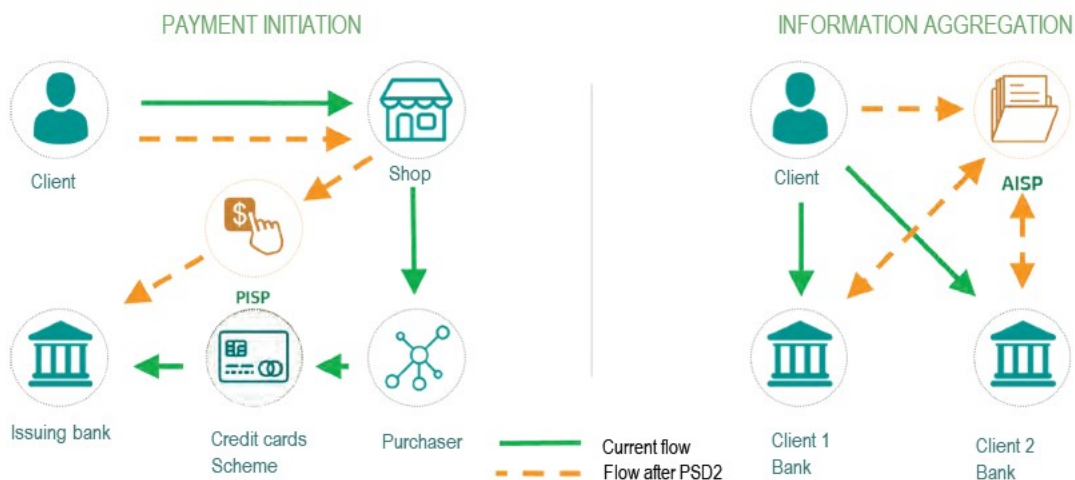


Illustration 3 New payment service providers enabled by the second payments service directive (PSD2). Source: Everis, in the 'IEB YEARBOOK on digital banking and fintech', [García and Hermida \(2017\)](#).

Fintech and bigtech (Amazon, Google and Apple) companies will find an opportunity to access large pools of information about their users, which can be used to expand the experience to personal agents acting as financial advisors ([García and Hermida, 2017](#)).

PSD2 will have multiple implications, many of which are currently unknown, as it encourages the 'API-fication' of the banking industry, and the *open banking* concept will lead to models boosting collaborations with fintechs in the financial sector.

In fact, it will become necessary to implement a model similar to *Banking as a Platform (BaaP)*, where cognitive technologies can offer new services using the bank's data lakes. According to [García de la Cruz \(2017\)](#), one of the possible models in the future is based on the neo-APIBank (see Illustration 4).

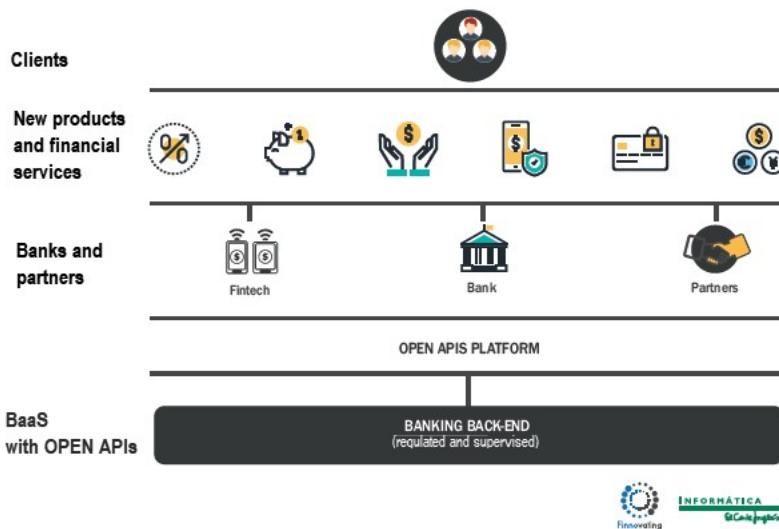


Illustration 4 The neo-APIBank. Source: 'IEB Digital Banking and Fintech Yearbook' [García de la Cruz \(2017\)](#).

In summary, this directive will encourage alternative models in the traditional banking sector, leading to an open banking platform that will facilitate work for fintech companies and encourage the entry of new players who will be able to offer financial services from different providers. Therefore, it is essential when analysing possible scenarios for the banking industry.

3.1. Impact of Fintech Companies in the Financial Sector

The fintech sector is still in its early phases; however, its development is being boosted by investment pouring into fintech, demand and acceptance from clients and the general efforts to create an ecosystem.

Traditional banking players have strong expertise in the financial sector, where they are well established, and project an image of trust and confidence due, in part, to being highly regulated. Awareness of the current trends in innovation means traditional players are reacting to the situation. Chart 9 shows some of the potential scenarios driven by the appearance of new actors in the banking system.



Chart 9 Potential scenarios for the banking system Source: IEB and Accenture, in Pellicer (2016).

According to Pellicer (2016), an Accenture white paper indicates that incumbents are reacting in three ways to the appearance of fintech companies: collaborating with new players; investing in fintech startups or technology; and ‘reimagining’ business models.

As in every business activity, fintech requires a maturation and concentration period. In other words, although there are currently around 15,000 fintech companies worldwide, only the strongest and most able to adapt (the most competitive) will survive. The same applies to traditional players.

Various scenarios on the impact of fintech companies are presented below.

3.1.1. Evolution of Relationship between Fintech Startups and Traditional Banking

Fintech startups develop innovative solutions for the financial sector, leveraging new technologies and thus dynamising the whole sector. This effect can be seen from different points of view.

- **Fintech startups as enablers for the digitalisation of the sector.** From this perspective, fintech startups are a pressure group for traditional players to explore technological business options by developing and applying new technologies.

In this case, fintech startups are not seen as competitors, but as an option in scenarios for low returns for traditional businesses.

This perspective encompasses the absorption, or dispersion, of fintech startups by traditional institutions, which belongs to the ‘new players are bought by the old players’ scenario in Chart 9 or, for example, the development of new solutions by a group of traditional players (such as Bizum). We also include here the neobanks with no banking licence launched by traditional banks.

- **Competitive perspective.** Fintech startups are seen as a stable threat to traditional banks and offering alternative products and services.

Fintech startups are here defined as a destabilising factor for the traditional banking system, offering disruptive services and boosting disintermediation. For example, the assertion ‘the banks lose market share’ in Chart 9 would encompass this perspective.

- **Collaborative perspective.** From this point of view, fintech startups are revolutionising the sector in collaborative terms. This perspective conceives fintech startups as innovators that develop a value proposition synergistic with traditional players.

In this case, the appearance of fintech startups is not a threat, but an opportunity, in which startups and traditional banks benefit each other.

As Yolanda Piazza, operations director at Citi Fintech, states: ‘the big banks have stable relationships with clients and are experienced in risk management, aspects that often fail in startups. Meanwhile, many fintech startups have simplified the user experience. By combining our strengths, we can offer innovative products faster than ever, and to many more clients.’ According to Banco Santander: ‘many Fintech startups are a success but still remain small. To lead significant change in the financial industry, it is necessary to bring these startups in and help them reinvent the processes and infrastructure that are core to banking. This can only be achieved in a collaborative effort where fintech startups and banks work together as partners’ (Gómez, 2017b).

Therefore, from this perspective, traditional banks benefit from a greater corporate flexibility, technological capacity, deeper digital culture and entrepreneurial spirit from fintech startups, and these fintechns benefit from a greater experience and consolidation. This perspective fits ‘all players position themselves to gain value’ in Chart 9.

This perspective also includes independent neobanks with no licence, given that a traditional bank supports them, and therefore, synergies between both players are generated.

Fintech startups initially raised contradictory opinions. They were considered as a ‘destructive’ phenomenon to be fought (competitive perspective); and as a passing fad that would act as an enabler for digital transformation within traditional banks (fintech startups as enablers for the digitalisation of the sector). However, the relationship between fintech startups and traditional players has evolved.

According to García de la Cruz (2017), banks have evolved from a destructive view of Fintech startups to a more constructive vision, and therefore, there is an approach for collaboration (collaborative perspective).

It is worth noting that the focus of startups has also changed. From a relational perspective, there has been an evolution from confrontational speech (‘banks will be substituted by startups’) to a more collaborative speech (‘there is value for both parties in collaborating’). This has been reflected in a commercial change, from B2C to B2B models, where some startups have pivoted from targeting end-clients to partnering with banks to more quickly and cheaply achieve scale.

There are many open lines of work. Some banks are creating funds to invest in fintech startups, others are launching startup accelerators and incubators to attract talent and integrate various business models, while others are partnering with startups to offer their products to clients.

This change in vision differs greatly from country to country. For example, Britain has 11 fintech incubators and accelerators, and Germany has 5, which is far ahead of what we currently have in Spain in terms of open work ecosystems (García de la Cruz, 2017).

It is also worth noting that some experts mention the term ‘fintegration’ in reference to the bank strategy of purchases and investments to accelerate digital transformation by acquiring technology, capabilities and talent (Gómez, 2017b). According to Castejón (2017), ‘new BBVA business models are being developed through acquisitions (such as the neobanks AtomBank or Simple), venture capital investments through the Propel Ventures fund (previously, BBVA Ventures), in Coinbase or Prosper for example, and through their Open Platform initiative using APIs to modularise finances.’

It seems that ‘collaboration’ is now the key word. It is also worth remembering that PSD2 will contribute to the development of fintech startups and, therefore, to promoting an ecosystem where both players co-exist.

3.1.2. New Potential Banking Competitors

Some observers believe that fintech startups will dominate the financial sector (competitive perspective), but there are increasing numbers of players in the competitive landscape of the global financial sector who are supported by PSD2 and open banking.

- Neobanks with licences (fintech startups turned into banks) will be relevant competitors, as they could evolve into more attractive players. In this case, we are referring to fully digital players such as Atom Bank, Fidor, Startling Bank, Number26 or Monzo.

One of the key advantages of neobanks is integration, as their clients will be able to use financial services and products from one consolidated mobile application. The main challenge for these players is to gain the trust of clients.

- Big tech firms, both American (Facebook, Apple, Google, Amazon and PayPal) and Asian (Alibaba, Ant Financial and Tencent), among others.

For example, according to [Castejón \(2017\)](#), ‘conversational banking is about to be “infomediated” by these entities with their natural language processing hardware (Echo at Amazon). This is a potential threat for banks as these tech firms will be able to identify financial needs from client data, and use this to offer financial services by connecting with different providers through an open PSD2 platform.’

- Telecommunication companies and some retailers will see the financial sector as a way of getting closer to their clients and generating more profit ([García de la Cruz, 2017](#)).

3.2. Bank Branches as Advisory Points

As previously stated, most banks are increasing the capabilities of branches to improve their efficiency. Within the EU, Spain has the smallest branches and the largest number of branches, making Spain one of the countries with the lowest ratio of population per branch.

The objective is to achieve fewer branches but with more employees per branch (even if this does not mean reaching the levels of Britain or Luxemburg with 40 to 100 employees per branch), as well as redesign the activities undertaken. Both the final number of branches and the activities undertaken will be influenced by the development of digitalisation in the banking sector, partly driven by client demand for alternative digital channels ([Chart 10](#)).

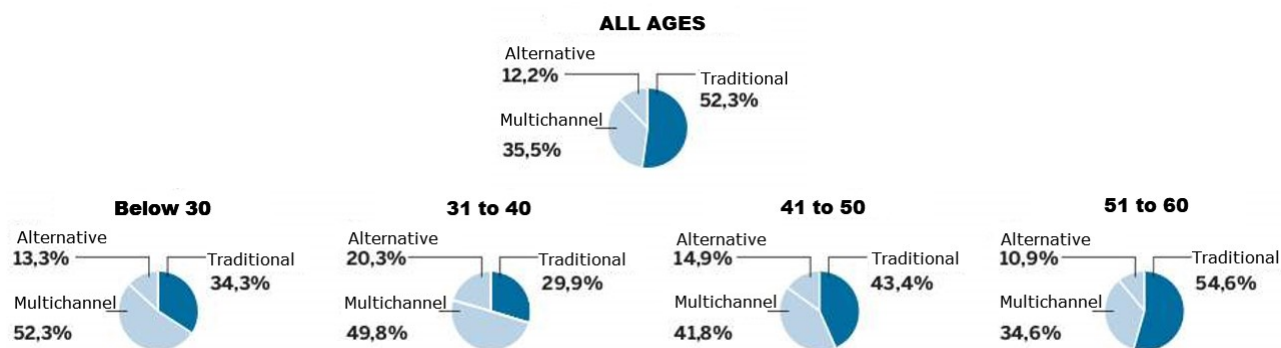


Chart 10 Customer profile by age. Source: IEB and Accenture, in [Pellicer \(2016\)](#).

Banks recognise that branches are expensive, but they are useful for developing customer loyalty. Further, many customers have not yet gone digital, so banks prefer an omnichannel strategy, where they can combine traditional with new channels.

Increasing demand for digital channels combined with an increasing number of fintech startups is affecting banking operations. Given this situation, banks prefer to redesign branches in an attempt to reinvent their capabilities to satisfy customers, save costs and face new players. Banks, therefore, are trying to reinvent traditional branches—which will become larger and more specialised.

As the use of digital channels increases, especially for satisfying the basic needs of the general population, so branches will become more focused on giving basic and expert advice. Some of the measures driven by the European Securities and Markets Authority (ESMA) requirements, and MiFID II, will enrich branch employee knowledge and capabilities for financial advising.

Many banks have started redesigning their branches. These new branches are more focused on offering advice and feature a more approachable design. The concept is to build open and bright spaces, with an innovative design, promoting conversation zones, meeting rooms and working desks that facilitate conversation between the bank and clients.

3.3. New Independent Financial Players

This section aims to highlight the models of open banking that will appear after PSD2 and the possible proliferation of new independent financial players. As stated before, this directive supports those fintechs focused on aggregating information. Some of these players would be:

- Online searchers and banking product comparators (e.g., buscoeconomico.com);
- Independent financial advisors, driven by the lack of financial culture of investors and bad banking practices emerging following various banking scandals (such as the mis-sale of preferential shares, subordinated obligations or minimum rates buried within variable rate mortgage agreements);
- Fintech startups focused on giving automated financial advice.

These independent players will modify the behaviour of direct bank customers. These customers, instead of going to bank branches for financial products or services, will go to these independent players (who will have comprehensive offers from various providers).

These players will be a layer on top on banks, which reminds us of the structure of other industries (such as the insurance industry with insurance brokers).

The advantage of these independent players lies in their supposed objectivity, as their aim is to offer products or services that best serve customer needs (independently of the financial provider). However, maintaining such objectivity will be a challenge for obvious reasons.

The knowledge and expertise of these independent players should be examined and certified before they are permitted to serve customers.

3.4. Blockchain Technology

Blockchain came with Bitcoin, a cryptocurrency created by Satoshi Nakamoto and published in 2008. In particular, Blockchain refers to the underlying technology that makes this electronic cash possible.

According to [Honrubia and Galán \(2017\)](#), Blockchain can be defined as a decentralised (hence its other name of ‘distributed ledger technology’, or DLT) and secure database, designed for the storage of data in a chain of blocks (see [Illustration 5](#)) and guaranteeing the inalterability of the information within.

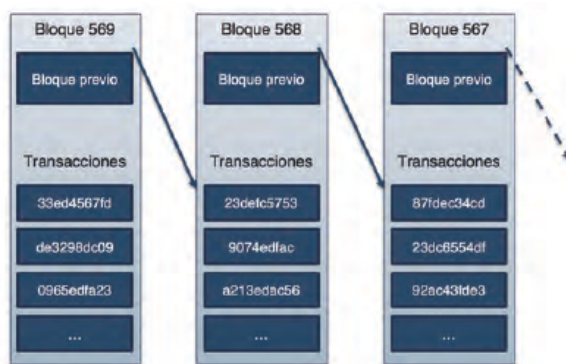


Illustration 5 Simplification of the Blockchain functioning. Source: UST Global, from ‘IEB Digital Banking and Fintech Yearbook’, [Honrubia and Galán \(2017\)](#).

This basic approach has been extended following major modifications (see [Illustration 6](#)).



Illustration 6 Blockchain technology generations. Source: UST Global, from ‘IEB Digital Banking and Fintech Yearbook’, [Honrubia and Galán \(2017\)](#).

The inalterability of the information and the fact that it enabled storage in a chain of blocks gave way to ‘smart contracts’ that suppose the main generational leap of blockchain technology. These smart contracts are pieces of executable code that can be added to transactions in a blockchain network and so open an infinite range of possibilities. It is possible to imagine a contract (agreement between two parties) that can be signed, stored in a site that allows you ‘forget’ it but automatically executable when contract conditions are met ([Honrubia and Galán, 2017](#)).

It is estimated that there are more than 650 cryptocurrencies that are together holding some 22 trillion dollars in circulation. In addition, more than 100 startups are working with blockchain technology and all the major world banks belong to an associated consortium.

Financial institutions were very reluctant to adopt bitcoin due a lack of regulation. However, in the last two years, they have seen the potential of blockchain technology, since it can transform entire industries (not only sectors such as the financial one). For this reason, there has been an exponential growth in blockchain investment and research, and this growth seems set to continue (although these investments are years away from generating savings or income).

According to [Honrubia and Galán \(2017\)](#), large corporations are currently investing in blockchain, although it remains necessary to identify the benefits from its use. It can be said that blockchain as a technology is clear and established. However, despite the fact that the ‘distributed’ concept has been known for many decades, ‘decentralisation’ still makes some people frown, and if we define it as ‘safe’ (because of a reduction in the effectiveness of cyber-attacks due to the lack of a central core of information), the number of agnostics is multiplied.

Blockchain technology would save time in the realisation of international transactions, as well as in the liquidation of shares and bonds, as a consequence of the reduction in the number of process intervenors. In addition, blockchain provides complete traceability of transactions, cost savings and also helps to prevent fraud (elimination of physical currencies). However, as disadvantages we could indicate the security problem that lies in the creation of intelligent contracts, for example, since these are software and, therefore, susceptible to vulnerabilities and errors.

In addition, according to [Castejón \(2017\)](#), the president of the European Central Bank (ECB) advocates constant monitoring and valuation of the new risks that may result from using blockchain in the payment system and market infrastructures. One of these risks is the possible fragmentation of markets if different technological approaches are deployed in the Eurozone. In his 2016 annual report, a section on blockchain warns that it cannot be considered an option at present because there are criteria of maturity, safety, efficiency, functionality, operation or governance that need to be solved.

Blockchain will enable new business models, and some sources indicate that it will produce the next revolution in the financial sector. There is discussion about the creation of the ‘Internet of Value’ (IoV).

According to the World Economic Forum, in the coming years, we will witness a transformation, and blockchain will become the ‘heart’ of the global financial system.

An example of the future that could await us is the arrival of the first decentralised bank, a bank that belongs to no one—but in which everyone can participate. This bank would reside in a blockchain platform as a decentralised autonomous organisation (DAO). In this line, the BABB1 startup is creating the first decentralised bank based on the Ethereum platform ([Honrubia and Galán, 2017](#)).

Finally, it is necessary to emphasise that the most suitable environment for blockchain technology would be a collaboration between financial institutions, regulators and technology companies, each contributing value to the overall process of its development.

4. Conclusions

After the economic crisis, the banking sector is now trying to increase profitability in a context of low interest rates, numerous problem assets, increasing regulatory pressure and the forecasted continuance of private sector deleveraging. The measures that banks are taking to improve efficiency consist of reducing more the installed capacity, the assignment of greater importance to bank fees in the revenue structure and their activity digitisation.

There will be fewer, but larger, branch offices. In addition, the business developed in these branches will be increasingly dedicated to advice, especially as customer demand for alternative channels increases.

Online banking in Spain has become popular over the last decade—with demand factors being age, educational level, ICT equipment and income. However, online banking would have grown regardless if we simply consider the supply variables, such as the advance of new technologies and the banks’ need to improve efficiency. The online purchase of financial products is still scarce and incipient in Spain.

To further boost online banking in Spain, it is necessary to reduce the digital divide with actions by public administrations and financial institutions. Public administrations’ measures should promote inclusion and digital literacy (digital agenda), especially for adults, and reinforce financial education; financial institutions’ ones should facilitate access to ICT equipment and optimise online channels. Other actions should aim to equalise the installed technological infrastructures (such as promoting the deployment of broadband networks, and next-generation access networks).

Fintech startups are the main drivers of digital transformation—and this transformation will change the banking sector completely by challenging the products and services that banks offer.

The global acceleration in innovation in financial services has several causes: increasing investment by venture capital firms in fintech startups; general unhappiness with traditional banking; the perception that new needs for information access by millennials are not being satisfied; and the digitalisation of most everything around us.

In addition, it is possible to distinguish between fintechs that involve the disaggregation of traditional banking and focus on specific areas (such as loans, digital payments, personal finance and automated financial advice); and

other fintechs (such as neobanks) which aim to offer all, or almost all, banking services in an integrated approach. It is important to point out that neobanks, specifically those which do not have a banking licence, need to work on top of the structure of conventional banks.

The tech world is wide, and there are many types of tech companies—such as insurtechs (insurance sector) and proptechs (property sector). Regtech (regulatory + technology), which in the financial sector is considered as an area of fintech, helps banks to handle regulatory requirements by using new technologies to comply with the current ‘tsunami’ of regulations.

The fintech sector is still developing, and after the emergence of numerous companies, a process of maturation and concentration is predicted. Nevertheless, the increase in investment in this type of company has attracted the interest of regulators—who have begun to study the risks these new technologies imply and formulate regulatory proposals. The difficult challenge for regulators is to reduce asymmetries in the European regulatory framework between traditional banks and new financial providers, preserving the integrity of the market while giving legal security to phenomena that would otherwise occur in the shade.

The fintech irruption is a clear challenge to traditional banking. Although fintechs were originally seen by some as mere instruments of pressure to digitise the sector and by others as a threat (competitive perspective), the current tendency is towards collaboration between both types of players. In this way, both benefit—and by working together, they can enable Spanish banking to remain one of the most efficient in Europe.

This collaborative view will also be encouraged by the open banking model raised in the new PSD2 directive, which supports the development of current fintechs and allows the entry of new participants. In fact, this directive may cause the end of banking as we know it.

Two new types of players in the global financial sector are neobanks with banking licences (which may become banking competitors) and the players that now cause most fear, namely, the big technology companies or bigtech (such as Facebook, Apple, Google, Amazon and Alibaba) with access to huge consumer databanks.

In addition, all parties in the financial sector are monitoring blockchain (DLT) technology as applied by many fintechs. In the coming years, blockchain is very likely to evolve and mature beyond recognition—and it could become the key to true disruption and create an ecosystem that raises society to another level. In the same way that internet meant the start of the information age (knowledge transmission), blockchain could launch a new era of value.

In short, technology intrusion in the banking sector will mean efficient and transparent access to financial services, as well as its democratisation (since customers will receive advice that they previously could not have received unless they had high levels of purchasing power). In addition, technology will provide banking with a global soul that will cause an increase in competition.

However, cyber threats are one of the main risks that the financial sector faces as part of its digital transformation, and the growth of digital confidence will determine the development of this transformation.

The key to success of digital transformation will be not be seeing the process as so much complex gibberish, but as an opportunity to reformulate the sector and continue meeting the needs of customers. In the end, banking will remain a people business—although often a click away.

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