TRADITIONAL BANKING AND DISRUPTION FINTECH. EVOLUTIONS, CAUSES, TYPOLOGIES

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Abstract: *In recent years, financial innovation has accelerated greatly, new financial services have radically changed the banking environment. The main factors contributing to the dynamism of fintech are the development of IT and mobile communications infrastructure, pioneering financial services offered by new technology companies and the design of new financial services based on consumer needs. The fintech areas are: credit, deposits and capital raising services; payment, clearing and settlement services, including alternative currencies; financial investment and insurance services. However, in the near future many of the new financial services will not pose too much of a problem for banks. For example, P2P loans will reduce the market share of banks, but in no case will they eliminate bank loans because, on the one hand, the clientele that will go to the market for P2P loans will be the risky one, unapproved by banks. and on the other hand, because credit institutions still have the majority of resources and the majority of customers. Another example is payments, which continue to be carried out mainly by banks because alternative systems do not yet have a global infrastructure, and the completion of payments presupposes the existence of the legal tender issued only by central banks.*

Keywords: *fintech, banking, P2P loans, crowdfunding, alternative currencies,*
JEL classification: *G21***.**

1. Introduction

The Basel Committee on Banking Supervision - BCBS (BCBS, 2018) defines fintech using the definition Financial Stability Board (FSB), as being "financial technology innovation resulting in new business models, applications, processes or products with an associated material effect on financial markets and institutions and for the provision of financial services". This definition is considered useful by BCBS due to the current fluidity of fintech developments, focusing on fintech effects, which are particularly relevant for banks and banking supervisors. It is also worth noting that the term fintech is used to describe a wide range of innovations in financial technology made both by existing banks and by other participants, such as start-ups or large technology companies.

The same source (BCBS, 2018) mentions the results of a survey indicating that most respondents did not uniformly define terms such as fintech, innovation or other similar categories, indicating that the public or participants in the process do not have a clear opinion on the dimensions of fintech, a rapidly evolving field. Participants describe terms such as fintech, innovation or the like as representing (a) an innovative financial service; (b) a new business model provided by a bank or non-financial corporation; or (c) a new technology start-up for the financial industry. Another observation is that some participants made a clear distinction between innovation and disruption, with innovation falling within existing regulations, while disruption requires the development of new rules.

Areas of significance assigned to the categories of fintech, innovation and others are important in terms of how supervisors address or will address the fintech, possible regulations should define new products and specific services for a precise approach.

The categories circumscribed or related to fintech are: application programming interface (API), artificial intelligence (AI), big data, bigtech, cloud computing, copy trading, crowdfunding, cyber-crime, cyber-risk, digital currency, distributed ledger technologies (DLT -distributed registry technologies, also known as blockchain), innovation accelerator, innovation hub, IoT (the internet of things), ML (machine learning), online lending platforms, mobile wallets, neobanks, regtech (regulatory

technology), robo-advisors, security biometric services, smart contracts, suptech (surveillance technology) and the list goes on.

2. Evolutions

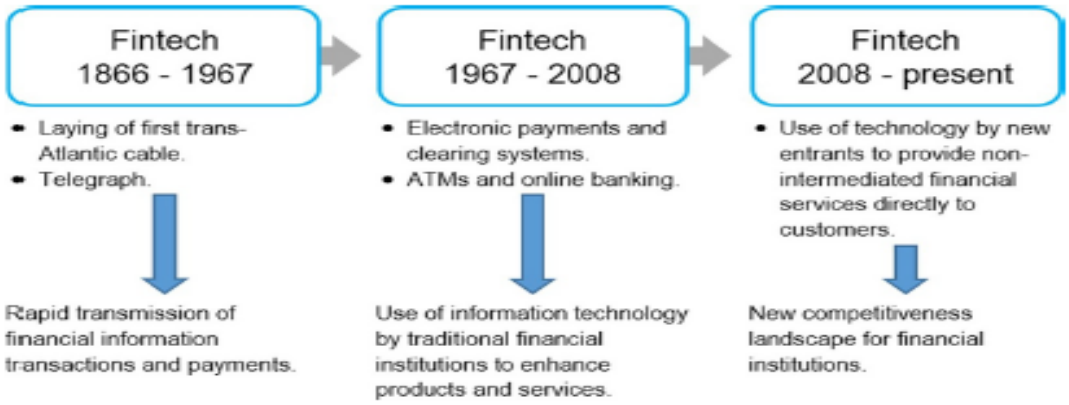
The purpose of this paper is to summarize the main aspects of the concept of "fintech". Fintech is part of the development of financial innovation, which is consolidated into new business models, applications, processes and financial products and new methods for providing financial services (Thake, 2019).

Currency and financial services are several millennia old (obvious if archaic, little evolved ones are included), but for a long time innovation was very slow. In recent years financial innovation has greatly accelerated, new financial services (credit card, electronic payments, virtual banks etc.) radically changing their physiognomy. Most (Arner et al, 2015) believe that we are now in the third phase of financial innovation (figure no. 1).

The first stage was fintech 1.0, which lasted about 120 years, between 1866 and 1987. In that period the physical foundations of modern telecommunications were laid, such as the installation of transatlantic transmission cables, the infrastructure connecting the entire globe. This was the stage when remote machine modern banking appeared, and financial institutions became interconnected. Although the financial industry went through this phase several decades ago, much of the infrastructure at this stage is still partially in use in many existing banks.

During the second stage, fintech 2.0, began in 1987 and lasted until 2008, the year of the globalization of the last great financial crisis. Note that this stage is much shorter, only 20 years old, but financial innovation is much broader. Thus, banks have become increasingly digitized, and have built a significant IT infrastructure; there were ATMs, automatic coin counters, self-banking etc. Also central clearing counterparties, stock exchanges, international banking correspondence migrate to the digital and begin to generalize in this form, and regulatory standards begin to have global meanings.

Figure no. 1. Stages in the evolution of fintech



Source: Thakor, 2019

The current stage, fintech 3.0, is underway and involves both the financial service (product), radically changed as a result of technology, but also financial companies and traditional banking institutions. The main feature of the third phase is that the new financial products are not created by traditional financial intermediaries. New fintech start-ups are the cradle of new financial technologies, and traditional banks do not seem to have a minimum level of IT literacy.

In the approximately 150 years of financial innovation, the finding is that the driving force behind financial innovation has changed over the years, from major infrastructure providers to banks and now to IT companies, new start-ups, which form the fintech world.

3. Factors that amplify fintech innovation

A 2017 study (Varga, 2017) found that the main factors contributing to fintech dynamism today would be the unprecedented development of IT and mobile communications infrastructure, pioneering financial services provided by new technology firms and, last but not least, designing new financial services based on consumer needs.

Innovation in the financial field is generated primarily by technological progress and the cheapening of basic telecommunications services and IT equipment, but also by their availability. This includes developments in hardware, IT in software technology, such as accessible computers, mobile phones, rapid penetration of the Internet, but also the fact that a growing number of people possess programming skills and basic knowledge in the field of IT. Equipment/hardware is becoming cheaper and more diversified: desktops, laptops, tablets, which make it possible to obtain fintech on a lot of devices, and entry barriers are lower and lower. A telecommunications infrastructure has been installed in all major cities of the world, and free Internet, accessible in more and more places, can also be used by people at the bottom of the social ladder. Likewise, mobile phones, including smartphones, have become cheap products. In addition, they increase the opportunities that people have to connect and interact more deeply with others, but also with the payment infrastructure. But cheap hardware has made it possible for low-income individuals to develop their computer skills and programming skills, some even using free educational materials available on the Internet.

The second factor that energized the fintech sector was the financial services innovation approach adopted by fintech companies. fintech technology companies adopt streamlined business models and focus on niche segments of the financial sector. The case of those two billion adults in the world without access to basic banking services, which are approached by these fintech companies, is often cited, relying precisely on the disinterest of traditional banks towards these categories of customers. Providing personal financial services, such as current or savings accounts, transfers, remittances, loans, etc. can help people at the bottom of the hierarchy get out of poverty. So many card companies, fintech companies, mobile operators intend to do this, while at the same time generating untapped revenues from traditional banks. There are opinions that the services offered by fintech companies are, in this case, social services. The successes registered by Grameen Bank (microfinance organization and community development bank in Bangladesh, providing small unsecured loans to the impoverished) are cited, initiated by Nobel laureate, Professor Muhammad Yunus, who helped improve the personal finances of previously under-banked people; Likewise, the success of M-PESA, operated by Safaricom - a subsidiary of Vodafone - which has become the largest transfer service in Kenya. The success of M-PESA (which provided an e-money account in Kenya related to the user's mobile phone number using the company's mobile telecommunications technology infrastructure and only requires users to have a cheap feature phone to make peer-to-peer payments) and which proves that mobile operators can play a major role in providing basic financial services to people at the bottom of society. Through the customer segments that fintech companies target, they rely on lower profit margins and higher volumes of financial transactions (Haldane, 2016, in Varga, 2017). Let us also remember that we are talking about democratizing the financial sector, by improving access to these services.

Many pioneering services were offered in developing, poor countries, where most of the population, invariably poor, bypassed traditional banks. In addition, in many of these

countries made major leaps in the adoption of new or technologies, which as mentioned are cheap.

The construction of bank branches in poor, mostly rural countries was avoided by traditional banks because they could not generate enough income from micro-remittances that individuals living there wanted to make. Nor did lending to under-banked people seem to be a profitable business for traditional banks because the individuals who lived there could not meet the strict and traditional banking criteria for assessing credit risk. Thus, while traditional banks were abandoning sub-banked regions, fintech companies were eager to exploit these opportunities, using technology, pre-existing infrastructure built by telecommunications companies (which meant low operating costs), available customers and services at accessible prices.

In this context, it should be noted that fintech companies enjoy several advantages over the traditional banking sector. Thus, fintech companies do not depend on old basic computer systems, many of which are over 30 years old and have been repeatedly upgraded with new additional services, which are a heavy burden for innovation, because the basic functionalities and infrastructure are outdated, and modifying old systems and infrastructure is costly and poses additional operational risks. The IT departments of traditional banks are not prepared to respond quickly to customer needs, and any change in IT systems involves a series of preparatory works that involves a period of time (even months) before any change. Meanwhile, fintech companies are building their business models around technology and software, with IT being an important factor in their success, in which they invest heavily, especially in state-of-the-art programming.

A third cause of fintech companies' dynamism is explained by the fact that they build their products, by focusing on the customer, the user, offering useful tools and the possibility to experiment. The development of new financial products and services by fintech companies has been exacerbated by customers' loss of trust in traditional banks, especially due to their role as initiators of the financial crisis that began in 2007-2008. The recession that followed the crisis, bank management's lack of transparency before and during the crisis, improper banking operations deeply affected the public's trust in traditional banks. This facilitated the rise of new fintech companies, which quickly gained market share at the expense of banks. In addition, the financial situation during and after the crisis somewhat reduced the importance of banks (for example, the relative decline in corporate credit in the context of risk aversion in the traditional banking sector or low interest rates that discouraged savings). fintech companies understood that public disappointment with banks had created an opportunity for better financial services and more user-centred innovation. fintech companies design their services to be available on all types of digital devices: mobile phones, tablets, even smart watches. Customers no longer have to wait in bank branches to approve a loan, make a financial transfer or open bank accounts. Millennials (i.e. those born in the 1980s and 1990s) are looking for different, more personalized and convenient services. Cited studies (Viacom Media quoted by Varga, 2017) found that 53% of millennials do not believe that their bank is in any way special or offers something different to other intermediaries. fintech companies are also gaining market share by offering customized analytics-based solutions, customized financial management solutions that help customers manage their money wiser, peer-to-peer lending platforms with much more default payment estimation models, precise and competitive loan opportunities with much lower interest rates than banks.

Fourthly, *I believe that national or supranational authorities, whether governmental or banking, intervene in the market and stimulate the development of this fintech segment through a series of regulations that require/oblige banks to open their servers for IT companies. The clearest example is that of the European Union. Thus, in October 2015,*

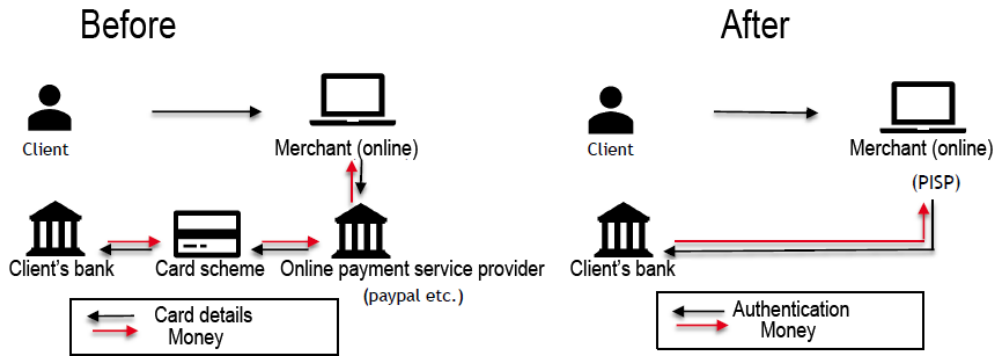
the European Parliament adopted a revised payment services directive, known as (PSD2 - Payment Service Directive 2). Thus, the new rules aim to promote the development and use of mobile payments through open banking services. At the same time, it requires banks to allow companies, creating banking IT solutions, access to their payment infrastructure - application programming interfaces (APIs) - and customer data, up to the level of account transactions (payments and receipts).

Thus appeared the phrase "open banking", designating that part of financial technology that refers to the use of APIs (application programming interface), that allow third-party developers to build additional services or applications that support banks or become their competitor. Open banking thus offers greater financial transparency for account holders, ranging from open data (already available as public information) to private data.

These third-party developers (Anton, 2018), generically called "TPP" - third-party providers, can be non-banking institutions, fintech companies or merchants that can be authorized as payment service institutions. TPPs are divided into two groups: Account Information Service Providers (AISP) and Payment Initiation Service Providers (PISP).

The introduction of PISP in payment schemes is an essential change in the banking industry, because until this directive, bank transfers were made only by banks and electronic money/card issuers. Thus, by authorizing PISP, merchants can, with the customer's consent, access their account data, and online purchases can be settled directly by the merchant, as PISP, based on customer acceptance, without the intermediation of a card and without involving another payment processor.

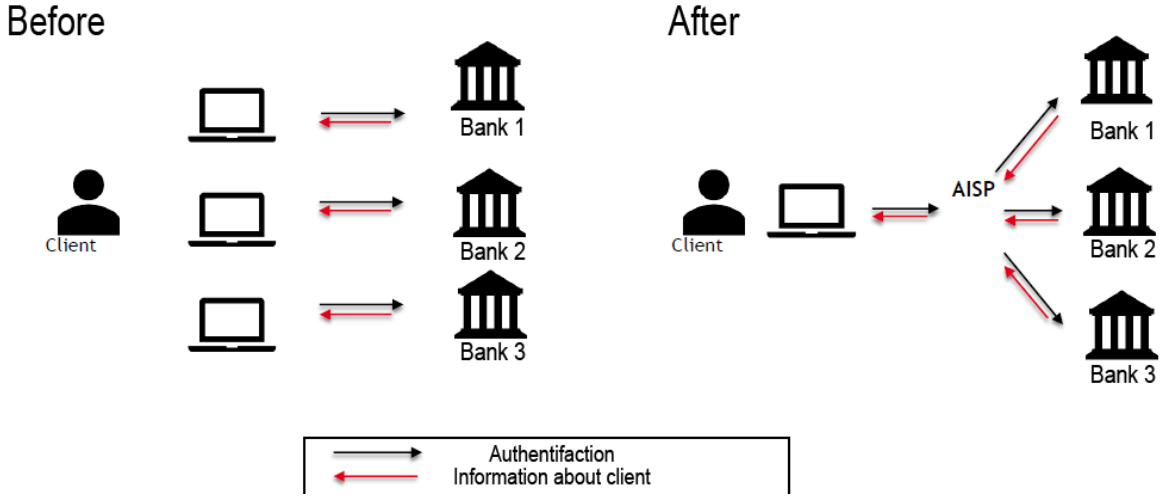
Figure no. 2. Comparison between the traditional payment technique and the payment model under the conditions of existence of PSIP (payment initiation service providers)



Source: Anton, 2018

AISPs are providers that access bank accounts and extract information about the availability of these accounts, based on the explicit consent of account holders. If the client has several bank accounts, AISP services will allow them to access their account data held in one place. AISP can also analyse the client's financial behaviour, based on data about their accounts, and make recommendations for streamlining transactions.

Figure no. 3. Comparison between the traditional way of consulting the account balance and the model in which payment initiation service providers (PSIPs) operate



Source: Anton, 2018

Third party providers (TTPs) must be licensed as payment service providers (PSPs) and have the right to provide services throughout the European Union on the basis of the authorization received in the country of origin.

PSD2 improves security policy and wants for a way to reduce risk, to protect customers against fraud and illegal use of sensitive and personal data.

PSD2 is recognition of the "fintech" revolution in the payment services market and eliminates banks' monopoly on customers' banking data. In fact, PSD2's objective is removing barriers from the payment services market, forcing banks to allow third parties access to the information related to bank accounts.

But banks too will take advantage of the new regulations, expanding their offerings. It is thought that new payment methods will become popular through the connection with social networks, moving to instant payments: we see an advertisement on, for example Facebook, we want this product, we put it in the cart, we allow Facebook to access our bank account, and through biometric data (fingerprint, facial recognition, etc.) we accept payment to the merchant. No complications, no IBAN or other codes, no bank card. And an intermediate conclusion, THE CARD'S DAYS ARE NUMBERED.

For the client, PSD2 will mean access to innovative payment services, alternative cards, access to all bank accounts via a single application, efficient use of information about the turnover of accounts, investments, comparative analysis of the costs of payment services, bank fees, instant payments to merchants or service providers.

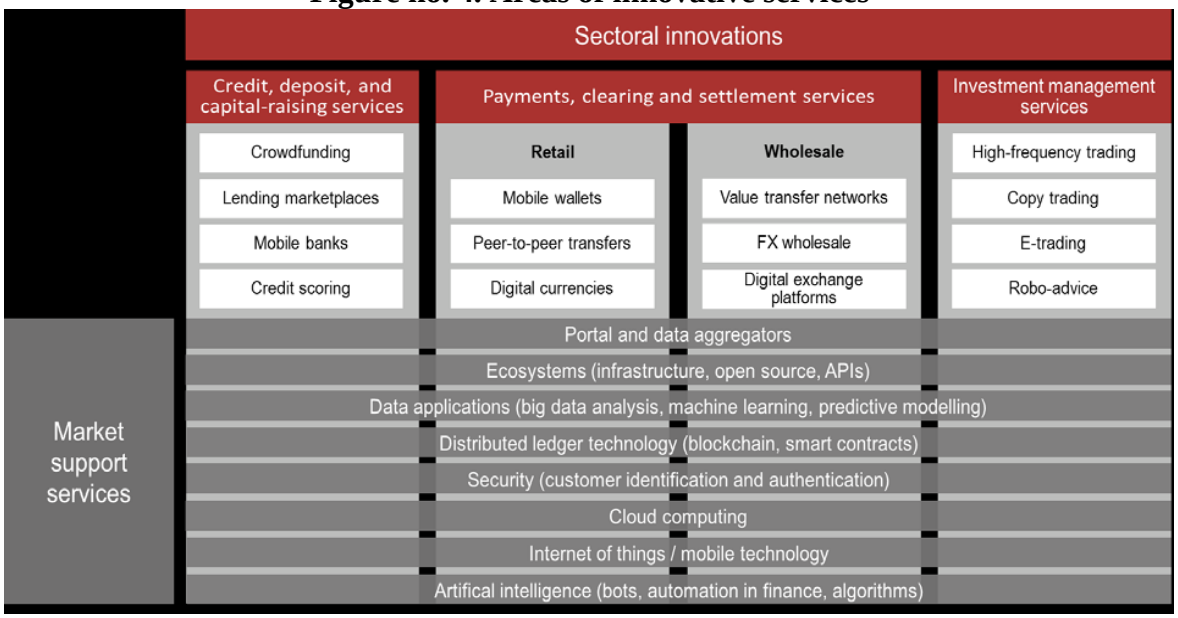
When assessing the impact of new technologies on the banking industry, two factors are particularly relevant: (i) the rate of adoption of basic technology in society and (ii) the technological knowledge of the general population to be able to use the new technologies. The Basel Committee on Banking Supervision (BCBS, 2018) is of the opinion that the current pace of innovation is faster than in previous decades and there are signs that the pace of adoption will increase. For example, the adoption of ATMs took place over two decades, while internet banking and mobile banking took root in a shorter period of time. In addition, a generation of digital natives has reached maturity, and their technological skills match the innovations of the fintech era perfectly. In fact, we are witnessing a change in customer behaviour and demand for digital financial services, and the rapid pace of change means that the effects of innovation and disruption can occur faster than before, implying the need for financial operators to adapt more quickly to changing environment.

4. Fintech domains

In general, fintech circumscribed domains are:

- loans, deposits and capital raising services;
- payment, clearing and settlement services, including the issuance of alternative currencies (digital, cryptocurrencies, etc.);
- management of financial investment services (including stock trading);
- insurance services.

Figure no. 4. Areas of innovative services



Source: BCBS, 2018

However, there are other opinions. Thus, BCBS (BCBS, 2018) uses a different classification of fintech innovations. Figure no. 4 describes the categories of fintech services and products, as well as market support services. There are three sectors that relate to basic financial services - banking and a number of market support services, that relate to innovations and new technologies that are not specific to the financial sector, but also play a significant role in fintech development.

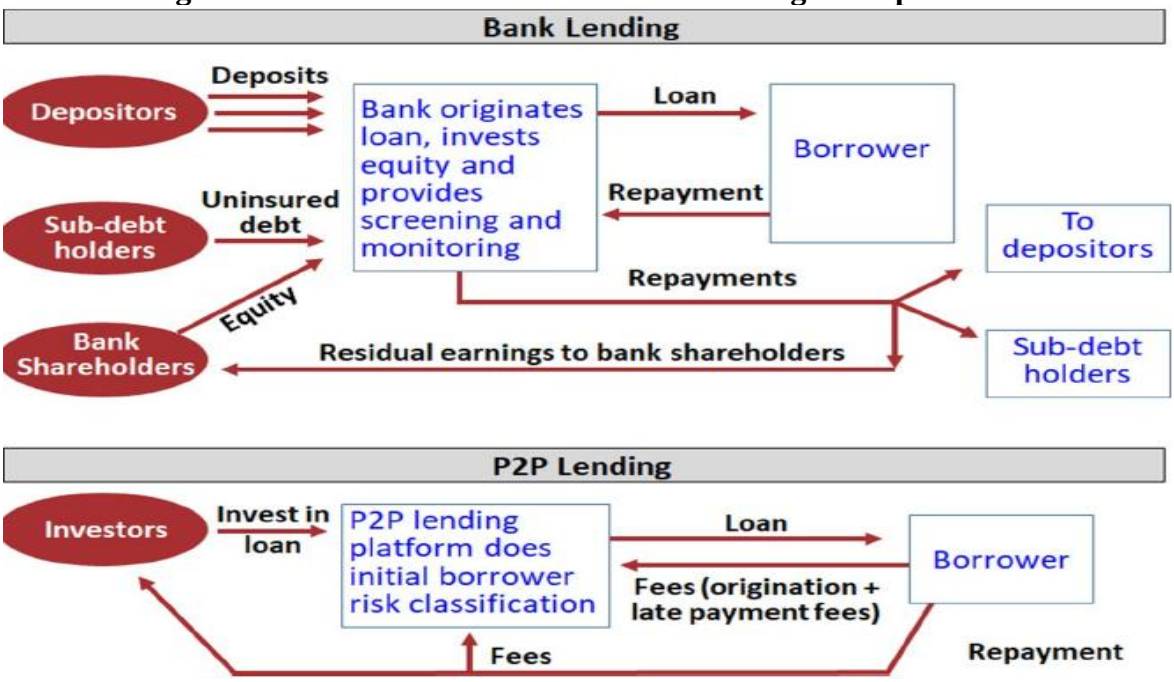
4.1. Lending services, attracting deposits and capital

A first category of banking services offered by fintech companies are loans, attracting deposits and capital, and take the form of **crowdfunding and online lending platforms** (both categories being generically called P2P loans), **mobile phone banking applications/mobile phone banks** (are banks intended only for mobile devices, also known as neo-banks or digital banks or challenger banks and should not be confused with an online account from a traditional bank. Mobile phone banks are 100% application-based, providing more transparency and convenience, with fewer restrictions and waiting times than the traditional bank.) and scoring services for credit applications (but also other data provision and lending services).

P2P loans - sometimes referred to as "market loans" - are loans granted or received by individuals and companies through online services, which directly link lenders to borrowers without the use of an intermediary bank. As reported by Milne and Parboteeah (2016), P2P lending increased in both the US and Europe after the 2007-2008 crisis.

The P2P loan process works as follows. The borrower submits a loan application on a P2P platform. The P2P platform conducts a preliminary analysis of the demand for credit and assigns a score ("degree of loan") which estimates the risks inherent to the borrower and the requested loan. Investors, in the sense of potential creditors, then bid on the amounts they want to give to the borrower and the interest rates. The platform then combines the offers made by potential creditors into a single loan. The P2P platform itself does not invest in the loan, so there are no deposits, subordinated debts and equity of the bank to finance the loan, as in the case of a bank loan. In the case of P2P loans, all the money is provided directly by the investors, who finance the loan, so it can be said to be unmediated, which means that there is no third party between investors and borrowers to commit their own capital. The costs of the P2P platform are offset by loan initiation fees (1-6%), any late fees paid by the borrower and a service fee for the platform as a percentage of all repayments made by borrowers (usually 1%). Because the owner of the P2P platform collects a percentage of the loan repayments, the platform has a function similar to that of a (minority) shareholder who performs an operational control.

Figure no. 5. Bank loan vs. loan obtained through P2P platforms



Source: Thakor, 2019

Although P2P loans increased significantly after the financial crisis of 2007–2009, the total volume of P2P loans is still small compared to bank loans. Total P2P loans amounted to $26.16 billion in 2015 and, according to Morgan Stanley (quoted in Thakor, 2019), are estimated to be between $150 billion-$490 billion by 2020. But by comparison, the volume of loans of US commercial banks amounted to $13.1 trillion in December 2018. The same source indicates the structure of P2P loans: consumer loans - 36%, business loans - 26.1%, financing of trade/factoring - 19.4%, mortgage loans - 18.5%.

The most popular P2P lending platforms are:

- in the USA: LendingClub Corporation (LC), Prosper Marketplace, Upstart, C ircleBack Lending, Funding Circle (co-founded in the USA and Great Britain) and Peerform;

- in Europe: Minto, Grupeer, IUVO Group, Housers, Bitbond, Zopa and Auxmoney.

But the largest P2P lending market in the world is China, with more than 4,000 platforms, making loans of about $20 billion a year (Thakor, 2019).

As features, it is cited that consumer credit P2P loans are cheaper than credit cards, are not guaranteed, and in the US are subject to U.S. Securities and Exchange Commission regulation and must comply with state laws, but the regulation of these platforms is much lighter compared to banking regulations.

The use of fintech in lending operations is not limited to P2P platforms. Here we must mention shadow banks (shadow banks/alternative banking system), some financial intermediaries that provide maturity transformation services, such as banks, but are not financed from deposits. Shadow banks make extensive use of information technology in lending, but do not seek to match the needs of debtors with those of creditors (on equal footing, as on a P2P platform). They invest their own capital and have balance sheets somewhat similar to those of banks, except that deposit financing is replaced by debt financing and securitization collection. But the alternative banking system is much more complex and although not subject to supervision and regulation, it includes: (a) intermediaries that are not subject to banking supervision, such as hedge funds, (b) unregulated transactions/stocks, such as unlisted derivatives, and other unlisted instruments and (c) unregulated activities, such as swaps on credit/non-repayable loans at maturity (credit default).

4.2. Payment, clearing and settlement services and cryptocurrencies

The relationship between business and consumers is fast becoming digital. Companies are transforming the way they operate to meet the ever-changing needs of their customers and the growing use of mobile phones and devices. One area of the financial industry that is full of innovation is the payments segment. Businesses and users are adapting to online and offline transactions using mobile technology, such as smartphones, tablets or smartwatches, or various other mobile devices.

A first category included in fintech's payment, clearing and settlement services and cryptocurrencies sub-domain is **digital currency**. Digital currency (including virtual currency, electronic money or e-currency terminology) is an accounting balance or record stored in a distributed database, existing on the Internet or on a computer, in digital files or on a card, and which can be used for transactions, payments or held as an asset for subsequent transactions. Examples include cryptocurrency digital coins you coins you virtual coins they digital cash central bank and the electronic. Digital currencies do not have a physical shape like banknotes and coins. They are usually not issued by a government agency and are not considered legal payments, but allow - sometimes without any control - the transfer of ownership across government borders. These types of currencies may be limited and therefore only used in certain communities, such as the purchase of services or an online game. Also, many digital currencies are used to buy other digital currencies. Digital money can be centralized, where there is a central point of control over the money supply (and there are projects of many central banks in this regard) or be decentralized, where the control over the money supply is exclusively private.

The biggest disruption of fintech in payment services was the emergence of cryptocurrencies. The most popular cryptocurrency (sometimes called, partially true, and digital currency or virtual currency) is Bitcoin, which was launched in 2009 and allows P2P transactions independent of the banking system. Bitcoin is a digital computer code, issued cryptographically and which can be stored in an electronic wallet in cyberspace. Bitcoin and other similar coins are based on decentralization (in terms of control, ownership, security and verification of transactions) and are based on a public digital register based on cryptography that replaces banks and is called a blockchain. The blockchain eliminates the need for a reliable financial intermediary, such as a bank, that verifies transactions and makes the control exercised by the state/regulators/governments

unnecessary. The emergence of Bitcoin was followed by the emergence of other alternative currencies ("altcoins"), as well as cryptocurrencies and alternatives to bitcoin. They all use a similar peer-to-peer system to validate transactions (a process called mining) and add them to a blockchain. The differences between them consist in algorithms for validating transactions ("proof of work, mining"). Here are some altcoins: Ethereum, Litecoin, Bitcoin Cash, Dogecoin, Monero etc. While some believe that Bitcoin and other cryptocurrencies are a coin, others considered it a financial investment.

But cryptocurrencies are also a solution for those seeking funding for various projects through a mechanism called an initial coin offer (ICO). An ICO is basically a version of cryptocurrency issued through the crowdfunding mechanism. Thus, cryptocurrency developers sell tokens to investors, who become part of the project, to obtain financing. In some cases, investors can withdraw from the project, trading their chips bought on a secondary market.

Since 2016, more than 24 countries have been investing in distributed registry technologies (DLT), with investments of $1.4 billion. In addition, more than 90 central banks are involved in discussions on DLT, including the implications of a central digital currency (EconoTimes, 2017). Here are three examples:

- The Bank of Canada has explored the possibility of creating a blockchain version of its currency (TEAGUE, 2016) and did a simulation in 2016, issuing CAD on a blockchain similar to Ethereum, and commercial banks used the new CAD currencies to close their positions at the end of the day and settle their balances.
- The Dutch central bank is experimenting with a bitcoin-based virtual currency called “DNBCo in” (Popper, 2011).
- The same source mentions that the Bank of England has embarked on a multi-year research program to explore the implications of a digital currency issued by a central bank and wants the next version of the bank's software infrastructure to be compatible with distributed registers (blokchain).

Mobile wallet. A mobile wallet is a virtual wallet that stores credit card, debit card, or other payment card information on a mobile device. Mobile wallets are a convenient way for a user to make payments in-store and can be used at merchants or service providers. In fact, a mobile wallet is an application that is installed on a smartphone. Once the application is installed and the user enters payment information, the wallet stores this information by connecting it to a personal identification format, such as a number, a key, a QR code or an image of the owner for each card stored.

When a user makes a payment to a merchant mobile app uses a technology called Near-Field Communication (NFC), radio frequency to communicate with the device’s acceptance of the trader’s. NFC uses the personal identification format created for the card and user to communicate payment information to the merchant's POS terminal. The information transfer is usually triggered when the user waves or holds the NFC-enabled mobile device over the store's NFC reader (POS terminal).

Not all smartphones or mobile devices are equipped with NFC technology.

For example, for iPhone users, there are alternative ways to use their mobile wallets to make payments in the store, the special application being Apple Pay. Thus, when you buy something, Apple Pay uses a device-specific number and a unique transaction code. So the card number is never stored on your mobile device or on Apple's servers, and when you pay, the card information is never passed on by Apple to merchants. Apple Pay works with Face ID or Touch ID to authenticate the two factors. This means that you do not have to confirm payments by codes, secret questions or passwords. The most used mobile wallet in the US is PayPal, which allows users to make payments using their mobile phone numbers.

The phone number must be connected to the user's PayPal account for the transaction to be approved. Other mobile wallets use other personally identifiable features of the user. The LevelUp mobile wallet uses QR codes that can be scanned at cash registers. The late Square Wallet used the user's image, which could be easily checked by the cashier.

Fraudulent activities, such as identity theft, are more difficult to initiate with mobile wallets. If a user's credit card can be easily stolen or duplicated, smartphones are not that easy to steal, or even if it is stolen, it is hard to access if there is an access password or a fingerprint check is installed, or face-ID.

Mobile wallets are also useful for retail companies that make large volumes of transactions every day, as mobile wallets help reduce waiting and payment times.

Because mobile wallets are a digitized version of physical wallets, almost all cards stored in a physical wallet can be stored in the mobile wallet, such as driver's license, social security number, health cards, loyalty cards, bus or train cards.

In addition to mobile wallets, there are also digital wallets. Although both store payment information, it is implemented differently. Digital wallets are mainly used for online transactions and cannot necessarily be used on mobile devices. Mobile wallets are used by people who would rather not carry a physical wallet when shopping in store. Apple Pay, Samsung Pay and Android Pay are examples of mobile wallets that can be installed on a portable device. A regular PayPal account is a form of digital wallet, but when used in conjunction with mobile payment services and mobile devices, it works like a mobile wallet.

Peer-to-peer transactions (also called person to person transactions, P2P transactions and P2P payments) are electronic transfers from one person to another via an intermediary, usually a P2P payment application. P2P payments can be sent and received via mobile device or any personal computer with Internet access, providing a convenient alternative to traditional payment methods. Through the P2P payment application, each person's account is connected to one or more user bank accounts. When a transaction takes place, the account balance in the application records the transaction and either sends or withdraws money directly from the user's bank account or stores it in the user's account within the application. Since the inception of this concept, many businesses have developed P2P transaction capabilities, increasing competition and consumer convenience, and the invasion of mobile devices in everyday life has further boosted the number of P2P payment applications, becoming more convenient for users. The company that wrote history in the field of P2P payments was PayPal, which specializes in electronic money transfers. The payment system initially served both e-commerce companies and individuals, and became global after the acquisition of PayPal by online retailer eBay in 2002. The eBay business model has required a transaction intermediary to facilitate payments between customers and sellers. Buyers needed this service because they did not want to disclose credit card information to random sellers. Sellers needed this service because many did not have the means to open credit card merchant bank accounts to accept online payments.

Many of the previous services also have variants for enterprises (such as wholesale), being located: in the field of payment networks, foreign exchange transactions (FOREX) or digital exchange platforms. However, the number of applications in this category open to companies seems even smaller and, in addition, they lack notoriety compared to those open to the general public. Additionally, many of these applications, even if they operate in the virtual environment, do not seem to resist government action, with states imposing bans or limiting their activity. Probably at stake is tax compliance and money laundering prevention policies.

4.3. Investment management services

Fintech will significantly change the way stocks are traded, money is managed or financial advisory services are provided. In this sense, fintech has enriched financial services with applications such as: high frequency trading, copy-trading, e-trading, advisory robot.

High frequency trading (HFT). High Frequency Trading (HFT) is a trading method that uses powerful computer programs to trade a large number of orders in a fraction of a second (Chen, 2020). Applications use complex algorithms to analyse multiple markets and execute orders based on market conditions. HFT can be seen as a major form of algorithmic trading in finance, through the use of sophisticated technological tools and computer algorithms for the rapid trading of stocks. Traders with faster execution speeds are usually more profitable than traders with lower execution speeds. In addition, high frequency trading is also characterized by very high transaction values and a good balance between buy and sell orders. Some of the best known high frequency trading companies are: Tower Research, Citadel LLC and Virtu Financial. High frequency trading became popular when stock markets began to provide incentives for companies to add liquidity to the market. For example, the New York Stock Exchange (NYSE) has a group of liquidity providers called Supplemental Liquidity Providers (SLPs) that try to increase competition and add liquidity to existing quotas on the stock exchange and that are stimulated in the form of a fee ($0,0012 per security in November 2020) or in the form of a discount for the provision of market liquidity, which weighed in millions of transactions per day, means a consistent profit. The success of high-frequency trading strategies is determined by their ability to process large volumes of information simultaneously, which ordinary human traders cannot do. There are criticisms of HFT: they allow institutional players to gain an advantage in trading, because they are able to trade in large blocks using algorithms, the liquidity produced by this type of trading is momentary, disappearing in seconds, which makes it impossible for traders to take advantage of it, that it has replaced traditional brokers-dealers, that it uses mathematical models and algorithms to make decisions (which are taken in a few milliseconds, and this can lead to large market movements for no reason), that it has eliminated human decision and, last but not least, that it allows large companies to profit at the expense of small and retail investors.

Copy-trading (a form of social trading system) allows you to see what other people are trading in real time, to choose traders you like and to follow their activity (either for a fee or for free), copy their transactions with a single click and build a portfolio of user-based stocks. Any transaction made by the investor who copies is executed in the account of the trader who is copying. The investor who copies usually retains the ability to disconnect the copied transactions and manage them on their own. They can also close the copy relationship altogether. Copy traders are compensated by monthly subscription fees from investors who want to copy their transactions. Copy trading has led to the development of a new type of investment portfolio, "people-based portfolios" (investment funds are invested into other investors, rather than traditional capital market instruments) or "signal portfolios". Copy trading developed from mirror trading, another form of automated trading (algorithmic trading). Mirror trading is an automated trading system in which traders share their own trading history that other users could copy, mirroring, on their own account, all transactions of the copied trader (Fillipo, 2017). One of the first social trading platforms was eToro in 2010, followed by Wikifolio in 2012, and NAGA Trader, based in Europe and listed on the Frankfurt Stock Exchange in 2017, claims to have traded over 27 billion € on its platform in the second half of 2019 (Wikipedia, 2020).

Robo-advising. Robo-advisors (robo-advisor or "automated investment advisor", "automated investment management" and "digital advisory platforms") are digital

platforms that provide automated, algorithm-based financial planning services with little human supervision, if any (Frankenfield, 2020). A robo-advisor collects information from clients about their financial situation and future investment objectives (obtained through an online questionnaire) and then uses the data to provide advice and automatically invest clients' assets. The best robo-advisors offer easy investment account setup, efficient goal planning, account services, portfolio management, accompanied by high security, financial education and low fees. The first robot advisor, Betterment, was launched in 2008 and began managing investors' money in 2010. Their initial goal was to rebalance investments in stocks with financial resources, as a way for investors to manage passive investments (debt). After a decade of development, robo-advisors are now able to cope with much more sophisticated tasks, such as eliminating tax losses, selecting investments and planning investments in pension funds. As a result, the industry has seen explosive growth; the assets of robot-managed clients reached $60 billion at the end of 2015 and are estimated to reach $2 trillion by 2020 and $7 trillion globally by 2025 (same).

Most robo-advisors manage stock portfolios structured according to the proportions desired by investment account owners (modern portfolio theory is used to build passive, indexed portfolios for their users). These proportions are monitored by robo-advisors to ensure that they are maintained, even after price changes in the markets, but also that performance regulations are met. Robo-advisors do this using a fluctuation interval (rebalancing bands). For example, each class of actions or bonds is assigned a weight target and corresponding tolerance range (allocation strategy could include a requirement to hold 30% emerging market equity, 30% in blue chips and 40% in internal government bonds, all these shares having a fluctuation corridor of +/- 5% for each asset class). In practice, holdings in the emerging market can fluctuate between 25% and 35%, while 35% to 45% of the portfolio must be allocated to government bonds. When the share of holdings leaves the allowed band, the entire portfolio is rebalanced/reallocated to reflect the initial composition. In the past, this type of rebalancing at the level of each investor was not practiced by trading companies, because it was cumbersome, time consuming and generated numerous transaction fees. In the case of robo-advisors, this is practically automatic and free. Another frequently encountered type of rebalancing the robo-advisors - and is profitable by using algorithms - is the elimination of tax losses by selling stocks losses are offset by gains made by buying a UI similar title. The main advantage of robo-advisors is that they are low-cost alternatives to traditional counsellors. By eliminating the human workforce, online platforms can provide the same services at a fraction of the cost. Most robot advisors charge a fixed annual fee of 0.2% to 0.5% of a client's account balance, compared to 1-2% charged by a human financial advisor. Robo-advisors are also more accessible and available 24/7 if investors have an Internet connection. It takes less capital to become an investor, and some robo-advisors (Betterment) do not have a minimum limit, while many human advisors require an account of at least $100,000. Robo-advisors require less bureaucracy. The client does not have to call or physically meet with a financial advisor, explain their needs, complete the document and wait. Robo-advisors do all this with a simple click on a few buttons on the computer or on the mobile phone screen. Many digital platforms tend to target the young cohort of technology-savvy millennials and Generation X investors who feel more comfortable sharing personal information online and entrusting technology with important tasks such as wealth management. So the marketing efforts of robotic consulting firms use social channels to reach millennials. But the robotics industry is also proving to be interesting for baby boomer generations, who are high net worth investors and do not reject technology. Robo-advisors have the same legal status as human advisors, and they must be registered with the

supervisory authorities (Stocks and Exchange Commission in the US, and the official name is "registered investment advisor" or RIA for short).

4.4. Insurance

"InsurTech" is the fintech branch dedicated to insurance (Thakor, 2019). The basic element that is brought by fintech in insurance is the connection of devices (phones, watches, computers, etc.) worn as personal equipment, but also cars and other equipment in homes on the Internet and computers, which allows huge amounts of information to be gathered, personal information about individuals. This leads to "big data", which allows insurance companies to use them to calculate risk more accurately and in a much more dynamic way than they do today. Consumers can choose to use sensors and trackers provided by insurance companies, which then generate data that insurance companies use not only in setting the prices of insurance products, but also in designing these services, adjusting insurance premiums by rewarding certain types of low-risk behaviours. The results obtained from these monitoring are used in risk assessment and insurance premiums. This will avoid pooling customers with heterogeneous behaviours and use their individual risk profiles. It is expected that many of the traditional insurance contracts will be changed, reducing cross-subsidies from low-risk insurers to high-risk agencies. Also, new types of insured risks will appear, allowing the conclusion of insurance contracts for smaller and smaller risks, the accuracy of their assessment being higher and higher.

5. Conclusions

Fintech is vaguely defined as "innovation in financial technology that results in new business models, applications, processes or products with an associated material effect on financial markets and institutions and for the provision of financial services". This is because it is not yet crystallized, and the public, as mentioned in opinion polls, does not uniformly define terms such as fintech, innovation or other similar categories.

The world of finance is currently in the so-called fintech 3.0 stage, which involves both the financial service, radically changed as a result of technology, but also financial companies and traditional banking institutions. The main feature of the third phase is that new financial products are not created by traditional financial intermediaries, new fintech start-ups being the cradle of new financial technologies, traditional banks do not seem to have a minimum level of IT literacy.

Innovation in the financial field is generated primarily by technological progress and the cheapening of basic telecommunications services and IT equipment, but also by their availability. Included here are developments in hardware, IT, and software technologies such as affordable computers, mobile phones, fast internet penetration, basic knowledge and programming skills of a growing mass of people. Equipment/hardware is becoming cheaper and more diversified: desktop computers, laptops, tablets, which make it possible to obtain fintech on a lot of devices, and entry barriers, are lower and lower. The second factor that energized the fintech sector was the financial services innovation approach taken by fintech companies. fintech technology companies adopt streamlined business models and focus on niche segments of the financial sector. A third cause of fintech's dynamism is that new companies build their products, by focusing on the customer, the user, offering useful tools and the opportunity to experiment. Fourthly, I consider that a fourth driving factor for fintech is that national or supranational authorities, whether governmental or banking, intervene in the market and stimulate the development of this segment through a series of regulations that require/oblige banks to open servers for fintech companies. The clearest example is in the European Union, where in October 2015,

the European Parliament adopted a revised payment services directive, known as (PSD2 - Payment Service Directive 2).

In general, the areas covered by fintech are: credit, deposits and capital raising services; payment, clearing and settlement services, including the issuance of alternative currencies (digital, cryptocurrency, etc.); management of financial investment services (including securities trading); insurance services.

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