



Facultad de Ciencias Económicas y Empresariales

THE EFFECT OF TECHNOLOGICAL ADVANCES IN THE FINANCIAL SYSTEM AND SUSTAINABLE GROWTH IN THE LONG TERM

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ABSTRACT

In the current dissertation, the two present challenges in a globalized world were covered, technological change, and sustainable growth in the long term. After an extensive review of the current situation, we have identified the potential impact the Fintech and Bigtech industries can have on the financial system and what strategy banks should follow to face this new threat. Additionally, we explored how new technologies may help companies to grow in the long term and how technological advances help to attain the 2030 Sustainable Development goals established by the United Nations. To conclude, we made an overview of how these changes can affect the financial industry and how it may evolve in the near future.

Keywords: Technology, Blockchain, Fintech, Bigtech, Banking industry, United Nations, Sustainability, technological advances.

RESUMEN

En el presente trabajo se abordan los dos desafíos actuales en un mundo globalizado: el cambio tecnológico y el crecimiento sostenible a largo plazo. Tras una extensa revisión de la situación actual, hemos identificado el impacto potencial que las industrias Fintech y Bigtech puede tener en el sistema financiero y qué estrategia deben seguir los bancos para enfrentarse a esta nueva amenaza. Además, hemos explorado cómo las nuevas tecnologías pueden ayudar a las empresas a crecer a largo plazo y cómo los avances tecnológicos ayudan a alcanzar los objetivos de desarrollo sostenible para 2030 establecidos por las Naciones Unidas. Para concluir, hicimos un repaso de cómo estos cambios pueden afectar a la industria financiera y cómo puede evolucionar en el futuro cercano.

Palabras clave: Tecnología, Blockchain, Fintech, Bigtech, Industria bancaria, Naciones Unidas, Sostenibilidad, avances tecnológicos.

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1. INTRODUCTION

1.1. GENERAL PURPOSE OF THE RESEARCH AND CONTEXTUALIZATION OF THE SUBJECT

Since the invention of the first personal computer, the technology sector has experienced an exponential growth that continues to attract research attention. Nowadays, a new generation of companies, generally startups, is leading a revolution against traditional banking services. These new startups, characterized by their ability, flexibility, and constant innovation, offer alternative financial products and services and are pursuing the most profitable elements of the banking business value chain. This new industry is called Fintech.

One of the main goals of the research is to investigate the ways of making money from the banking industry and understanding in-depth the adding value they provide customers to see to what extent their business model is essential for society. A profound analysis will give us a better outlook on how the Fintech industry threatens banks' revenues. Throughout recent history, the view of the banking sector as highly complex has stopped new companies from entering the market. However, technological advances in fields as artificial intelligence, automatic learning, or blockchain technology are challenging the complexity of the banks' financial structures. Services can be provided cheaper and more efficiently, and startups pioneering in those sectors are starting to focus on specific income lines of the banks to get a piece of the revenue pie. During the research, we will examine the viability of the Fintech industry and how much these new companies may harm the banking industry while considering the options banks have to defend themselves and maintain their hegemony.

Additionally, as the impact of technology is much broader, those advances in artificial intelligence, automatic learning, or blockchain technologies do not only affect the financial industry but also mark the beginning of a radical change in the world as we know it. Technology can fuel economic growth, improve living conditions, and open up new and better types of work. It is interesting to analyze how progress in this sector implies improving sustainability in the long term, making the world a better place. To study more effectively the implications, we will examine two different fields; first, the impact of technology in business and how it may help economic growth, second, the effect it has on the attainability of the 2030 United Nations Sustainable Development Goals. Emerging technological startups have tremendous potential to solve problems faster than ever. We will examine which fields could be more benefited with concrete examples, and how technological globalization and innovation opens up new

opportunities for the underdeveloped countries such as accessibility to financial services, profoundly impacting the lives of millions of individuals and contributing to equality and progress all around the world.

1.2. OBJECTIVE

The dissertation will study the role of technological advances in both the financial system and the sustainability in the long term.

The first part of the dissertation will analyze how banks make money intending to understand why and where the Fintech industry could harm their income. We aim to find the most efficient way the market could work in this new situation and who may be the most damaged. At the end of the research, we will give an overview of how does the financial industry's future looks and analyze the real impact Fintech can have on it.

The analysis of sustainable growth in the long-term will be mainly based on the role of technology in the achievement of the 2030 Sustainable Development Goals. We will study how technological advances can become an excellent ally for the management and achievement of these objectives. Sustainable Development Goals are focused on a series of global challenges: Poverty, climate, environmental degeneration, prosperity, peace, and justice. We will see if new technological startups help achieve those goals and how technology offers an opportunity to meet and minimize the costs associated with the implementation processes of the objectives. Another objective related to sustainable growth is understanding how digitalization in the workplace helps companies and countries to grow faster and more efficiently.

The hope is having, at the end of the project, a better outlook of the broad amount of possibilities technology has to make this world a better place.

1.3. METHODOLOGY

Firstly, we will analyze how blockchain technology works and what benefits it could have to implement it in different systems. Then, we will evaluate the most common services banks offer and the ways they make money through them. To analyze how the Fintech industry is scratching income from banks, we will expand in the areas of the actual and potential expansion of Fintech startups and later on we will disaggregate the Income Statement of

various banks exposing, with concrete examples, the impact of the fintech startups in each line of their incomes.

Secondly, for the sustainable growth section, we will investigate what benefits have implementing these new technologies in the business world, and the impact technological advances have on the United Nations 2030 Sustainable Development Goals. We will focus in-depth on the M-Pesa case to show how technology startups can help reduce financial exclusion. At the end of the section, we will briefly summarize how blockchain technology can cooperate to create a more transparent and secure transaction system.

Finally, we will examine the new Bigtech industry and how these companies are threatening banks in some fields and how does the financial industry look like in the near future.

2. TECHNOLOGICAL ADVANCES

2.1. BLOCKCHAIN TECHNOLOGY

Blockchain is a technology that records transactions between two parties in an open and decentralized ledger, without the necessity of a third-party authentication. Satoshi Nakamoto discovered it in 2008, and even though at first it was utterly related to cryptocurrency, in 2014, some investors started to realize that it could be used for other sorts of operations.

The concept of blockchain could be summarized as a database whose essential characteristics are decentralization, encryption, reliability, and automation (da Silva Momo, Sordi Schiavi, Behr, & Lucena, 2019). Any company that provides a particular service or product based on a trust relationship between buyer and seller is vulnerable to the impact offered by blockchain. Not only for market disruption but also by providing new opportunities to create value in an appropriate business model to explore this technology (Cohen, Amorós, & Lundy, 2017).

On a blockchain operation, every party has access and means to verify the entire database, and all transactions are visibly recorded across a distributed peer to peer network (Mainelli, 2017). The blockchain potential does not only transform information technology (IT) but can also change land management, voting, shipping, copyright and licenses, supply chain tracking, and nearly any industry imaginable (Mundra & Lawlor, 2018). Blockchain-based “Smart contracts,” a form of a trusted third party, can automate and lower costs of transactions,

including licensing, revenue collection, or social transfers. Furthermore, Blockchain is already being used to validate individual identities. Estonia, for example, offers citizens a digital identity card based on blockchain. The United Nations Conference on Trade and Development (2018) estimated that Blockchain could improve the situation of more than 1.5 billion people worldwide who lack identification and are vulnerable to social, political, legal, or economic exclusion. Besides, in countries such as Ghana, Georgia, and Sweden, land, and property registration is increasing the use of this technology for validating government related property transactions and potentially reducing property fraud. In underdeveloped countries, property ownership is usually based on informal rights rather than any government ledger, giving government and big companies the possibility of unfairly seize homes and land of the unprotected. Blockchain provides better protection to citizens and prosperity to the country (Tett, 2017).

Additionally, blockchain can have a high impact in the trade industry, simplifying processes, reducing settlement times and errors, and increasing trust between all parties to a transaction (United Nations, 2018). In 2017, a group of banks started teaming up with IBM to build a new trade finance global system using blockchain to track goods and release payments automatically. Barclays and Wave claimed the first transaction with this original method when they guaranteed the almost \$100,000 of cheese and butter exported from Irish co-operative Ornuu to the Seychelles Trading Company. The process took less than four hours when it usually takes between seven to ten days (Arnold, 2017).

Experts consider that Blockchain could change the rules of the game in the technology industry, advisors at the professional services company PricewaterhouseCoopers have described Blockchain as posing “significant risks to the existing profit pools and business models” of financial services corporations (Kashyap, Davies, Garfinkel, 2016).

But how does it work?

When a buyer initiates a purchase in a blockchain transaction, a “block” is created containing transaction information such as payment method, date, and time. The buyer and seller can see and have to confirm the transaction. Every time a new deal is recorded, a new block is created following a chronological order, forming a chain that documents the transaction history. As each chain is encrypted, no one can change the transaction data once recorded, reducing the chance of fraudulent operations. With fewer ledger systems to maintain,

blockchain technology lowers transaction costs and speed processing times (State Legislatures, 2018).

A Blockchain chain can be structured in two different ways, public or private. Some similarities between them are that both are decentralized peer-to-peer networks, both maintain replicas in sync by consensus and provide guarantees of the immutability of the ledger.

As public chains are decentralized, no one controls the network, which means that once validated data cannot be changed. The combination of transparency, anonymity, decentralization, and digital assets in one technology is what distinguishes public blockchain from other distributed ledger technologies. Public networks require the agreement of 51% of users to make a change in the ledger (Ibrahim, 2018). An example of a public blockchain structure are cryptocurrencies such as bitcoin or Ethereum, which enable peer-to-peer transactions and, therefore, may revolutionize global payments. Meanwhile, the private blockchain structure operates as a centralized database system with access limited to specific users. As the network is controlled by one or multiple entities, it leads to the reliance on third parties.

It is interesting to analyze how this progress in technology may affect the financial system. However, before going deeper into the consequence that could have, it is necessary to understand how a bank makes money and where these new technologies could harm it.

2.2. BANKING SERVICES

A bank is a financial institution licensed to provide loans and receive deposits. It can be considered a financial intermediary between borrowers and lenders and, as Jhon Harry defines, “is an economic institution whose main aim is to earn profit through exchange of money and credit instrument.”

A bank does not truly create or destroy money; it transforms capital from savings into an investment, from credit to debit, and clears the borrowers and savers market gap (Sgambati, 2019). The most common services that banks offer to their clients are:

Deposit and lending

- Loans, which are amounts of money lent to the borrower and expected to be paid back at a specific time with an interest in exchange for the credit service. A loan may be for

a particular, one-time amount or as an open-ended line of credit up to a ceiling amount. Loans help markets grow more fairly, stimulating the economy and opening up competition by lending to new companies or helping existing businesses to expand. Financial institutions, corporations, and governments mostly issue them.

- Savings accounts are interest-bearing deposit accounts safe and reliable in which clients can store their money. The interest depositors will earn lower-rates compared to other investment instruments.
- Certificates of deposits (CDs), offered by most banks, are saving possibilities in which the client deposits a specific amount in an account for a particular period of time until the maturity date. The interest rate received in return is higher than in a savings account, but in case the client wants the money back before the maturity date, a penalty fee would be charged. As CDs are more useful to banks than savings deposits, in most cases, they pay CD investors a higher yield in exchange.

Payments

Once opened a bank account and after a client has deposited money on it, banks offer different options to spend it. Banks offer Credit and Debit cards to clients.

Debit Cards deduct money directly from the consumer's checking account. When paying with it, a hold is placed on the purchase amount. Then, once the merchant has sent the transaction details to the bank, the money will be transferred to the merchant's account in an operation that could take a few days to happen, depending on the bank's efficiency.

Credit cards give access to a line of debt issued by the bank. The transactions carried out with the credit card are reflected in the bill. The bank pays the merchant, and later, the customer pays the bank once received the invoice. If the customer spent more than its balance, it would be charged an interest, which is usually high. Credit card balance and payment history may affect clients' credit scores.

Foreign Exchange Service

Foreign Exchange is the exchange of one currency for another or the conversion of one currency into another currency. The laws of supply and demand value countries' currencies, and in free markets, currencies float freely against each other, keeping a constant fluctuation.

Banks services include buying foreign currency, international bank-to-bank transfers, or dealing with Foreign Exchange services for large multi-nationals.

How do banks make money?

Once analyzed the different services offered by banks to their customers, we are going to evaluate how banks make money through them.

The main ways banks make money with are:

1. Net Interest Margin

When money is deposited into a bank account, permission is given to the bank to use that money for any bank purpose. The difference between the income generated by the bank on investments and the amount of interest paid back to the lenders is called Net Interest Margin. Those interests received from loans are much higher than the interests that banks pay back to their clients for depositing their money in their accounts. BBVA (2020) defines it as “the difference between an asset’s profitability (the credit lines and loans that the institution has on its balance sheet, mainly) and the interest that the bank pays for the resources it needs to finance that asset (such as customer deposits and wholesale financing).”

2. Fees

○ Interchange Fees

Transaction fees that merchants must pay the bank whenever a customer uses a credit/debit card to pay for a product/service offered by the store. Not every merchant has to pay the same fee; some factors are affecting the transaction cost such as card types, transaction type, and business size/ industry. Merchants pay to the card-issuing bank to cover handling costs and the risks involved in approving the payment. For instance, Visa Inc. is planning the most significant changes in the U.S to swipe fees in a decade (Surane, 2020).

According to R.K. Hammer data compilation, swipe fees contribute the most substantial portion, \$52 billion, of the fees income banks collect.

○ Account Fees

Fees charged by banks to financial services such as credit cards or investment accounts. Even though they are charged for maintenance purposes, the price charged is higher than the maintenance cost. According to MoneyRates.com, the average maintenance fee is

\$13.47, which means paying around \$161.64 a year for having an account open (Barrington, 2019).

- **ATM Fees**

These fees are charged by ATMs every time a customer withdraws cash in an ATM that is not from its bank. The charged price usually rounds the \$3, and even though it looks like a small amount, in 2015, JPMorgan Chase, Bank of America, and Wells Fargo earned more than \$6 billion from these overdraft fees, according to a report from SNL Financial and CNNMoney (Adamczyk, 2016).

- **Brokerage Commissions**

When it comes to brokerage services, banks charge for making trades commission fees higher than discount brokers. They get a fee on every trade and a small profit by selling the stock and a higher price than the original price at which it was bought.

Moreover, brokerage services can make money even without charging a commission to the client, only by sending their customers' buy and sell orders to computerized trading firms such as Citadel Securities and Virtu Financial Corp. This service is known as well as "payment for order flow." Besides, once a new user has signed up for free trading, banks may offer other services to make money. In 2018, for example, JPMorgan Chase & Co. started offering 100 commission-free stock and ETF trades to clients in their first year (Massa, 2019). Most clients that sign up may keep using the service after the first year, and during that time, JPMorgan would be in contact with them to offer possible new services.

- **Foreign Exchange Service**

Whenever a customer buys foreign currency or transfers money from bank to bank internationally, banks charge fees.

- **Asset Management fees**

Some financial institutions offer the service of directing all or part of a client's portfolio in exchange for a fee.

However, there are some issues that traditional banks are facing these days in terms of perception. The Banking sector is oversupplied, with too many banks and very little differentiation between them. The rates offered are unattractive for investors, and there are

too many fees charged while the transparency of what they do with the client's money is minimal.

Due to these issues, technologies have led to the creation of companies that offer financial services and could compete directly with banks.

2.3. WHAT IS A FINTECH

2.3.1. Technical description

Fintech, an acronym of financial technologies, is the term used for companies or services that use technology to provide financial assistance to businesses or consumers. The term Fintech also describes how enterprises seek to improve the process, delivery, and use of financial services. The impact of it promises to force legacy financial institutions in developed economies to define their strategies (Mention, 2019).

The Fintech industry is reshaping the way we handle money and banking in both our professional and personal lives (Lynn, 2016). These types of corporations “are a global phenomenon, born at the intersection between financial firms and technology providers, attempting to leverage on digital technology and advanced analytics to unbundle financial services and harness economies of scale by targeting long-tail consumers.” (Sironi, 2016).

Technology has impacted the financial world profoundly in the past years. These new advances are giving the Fintech companies the possibility of competing against bank services utilizing blockchain, machine learning algorithms, and data science. New payment systems such as PayPal, Venmo, M-Pesa, ApplePay, and Alipay have emerged and are willing to change the rules of the game.

In 2015, Jamie Dimon, CEO of JP Morgan Chase, the largest U.S. bank, wrote a letter to shareholders warning that Silicon Valley was coming (2015). Why did he warn shareholders about this? Because new Fintech companies are threatening all business areas of the banking industry in market shares and profit margins (Navaretti & Pozzolo, 2017). Murad Ahmed, in his Financial Times article, declares that “The aim is to inflict death by a thousand cuts. Fintech start-ups are nimble piranhas, each focusing on a small part of a bank's business model to attack.” (2015).

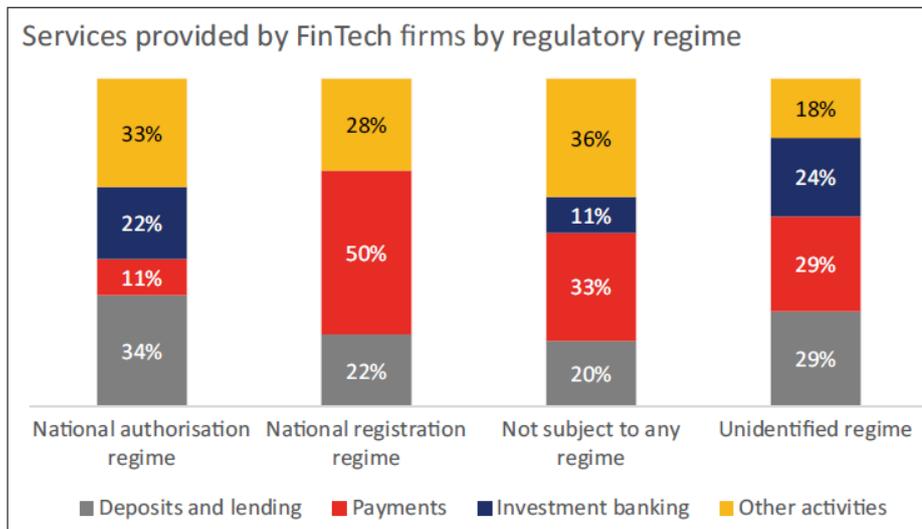
Most of the services provided by Fintech are comparable to banks, possibly more efficiently thanks to digital technological advancements, which could make the big bank sector to start losing clients. Even though the potential impact of Fintech companies on financial institutions is not clear, throughout this journal, we will estimate how it will harm them. It is crucial to analyze whether and how far Fintechs are replacing banks and other financial institutions. Would this cause disruption and financial instability or healthy competition that would benefit the clients and the economies? (Navaretti, & Pozzolo, 2017). Fintechs do not have banking licenses, money held for consumers can be for other purposes but deposits. However, Fintechs are blurring the nature of what it means to be a bank (Demos, 2016).

Traditional banks continue to see their businesses served by new entrants who are providing modern technology such as TransferWise, who, offering low-cost currency transfer services, has followed several revenues being solidly profitable for customers retailers and Small and Medium-sized Enterprises (SMEs). Besides, various digital banks such as Monzo, N26, Starling, OakNorth, Klarna, Revolut, and others continue to grow their businesses, entering into banking segments. As financial services, the optimal use of modern technology, and not suffering the questions about the use of data like some big technology companies give Fintech companies a competitive advantage (Casado, 2019).

During the second quarter of 2019, 3,048 million euros were invested in Fintech companies in Europe, of which 55.7 million were destined for Spain, which ranks sixth for investments received (Fund Society, 2019).

The application of digital technology has been developed the most so far in lending, payment systems, financial advising, and insurance. Fintechs have the capacity to lower the intermediation cost and achieve financial inclusion giving access to finance to underdeveloped countries (Navaretti, & Pozzolo, 2017).

FIGURE I. SERVICES PROVIDED BY FINTECH FIRMS BY REGULATORY REGIME



Source: Mansilla Fernández, J.M. (2017): “Numbers”.

2.3.2. Areas of expansion

The areas of the actual and potential expansion of Fintech are:

A) Transaction execution

The payment system coordinates intermediaries for the payor and payee. During the process, payor runs efficiency and cost risks, as well as risks of default cost in terms of the solvency of intermediaries and legal risks.

High costs, poor service standards, and unresponsiveness to user needs are the results of the uncompetitive practice that institutions of payment systems have settled. Fintech Innovations are changing the outlook of the industry. A fair amount of these innovations has appeared to support online e-commerce (Chiu, 2017).

B) Fund management

Peer-to-Peer (P2P) lending platforms allow individuals to lend and borrow money without bank intermediation. Borrowers request loans through the platform, and lenders can see the investment opportunities to fund the requests. Financial risk is higher since lenders only receive their principal if the loan is paid back in full (Bastani, Asgari, & Namavari, 2019).

Fintech companies have managed to add value to the customer, covering needs to which no one had yet responded. The crowdfunding platforms allow small business projects to be financed through the capital contribution of many private investors (Sekulits, 2019). Once enough investors commit to fund a loan applied by an individual, the system will generate all necessary documentation and fund it electronically. P2P lending companies usually make money from the operation by charging origination fees to borrowers and ongoing loan services fees to investors.

C) Insurtech

Insurtech is a combination of “insurance” and “technology.” Technology innovation used in the insurance industry to make it more efficient. The insurance industry is known for adapting slowly to new technologies (Lynn, Mooney, Rosati, & Cummins, 2019), and throughout the latest technological advances, processes can be simplified and improved.

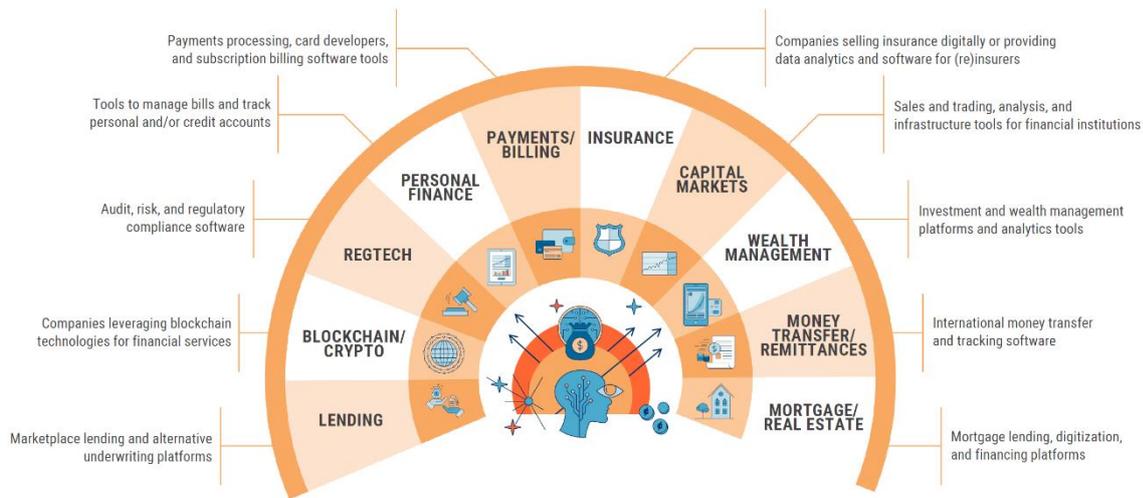
The United States is the leading country in the industry, where 60% percent of all insurtech transactions in 2016 happened. The United Kingdom and Germany are the second and third largest center worldwide. Interestingly, the most successful insurtech of all, Zhong An, is based in China and, with only a few years of operation, has a valuation of 8 billion dollars. The insurtech ecosystem in the rest of Asia remains relatively immature, but activity and interest are touring Singapore, Hong Kong, Mumbai, and Sydney (Sandhu & Maier, 2017).

The total value of capital invested in global Insurtech companies during the first half of 2019 was approximately 1.1 billion U.S. dollars. In the previous year, the total amount invested in the sector reached 7.6 billion U.S. (Rudden, 2019).

D) Investment Management

Robo-advisors: Automated investment services that use algorithms to advise lower investment costs and increase accessibility to the services. Traditional companies such as Fidelity have started offering this kind of service (Leonhardt, 2018).

FIGURE II. WHAT FINTECH COVERS.



Source: CB-Insights. (2019). Global Fintech Report Q2.

Can they compete with banks?

The decision of whether to challenge banks or to join them will depend mostly on regulations and entry barriers. Although regulations are the biggest problem, there are two further entry barriers to take into account: traditional firms' ability to block market access and the difficulty in obtaining a federal bank license. Their dominant and privileged market position makes some firms limit market access. For example, more than 99 percent of credit card transactions are run by Visa, American Express, Mastercard, and Discover networks (Chang, 2015).

The General Data Protection Regulation (GDPR), implemented on 25 May 2018, and the Payment Services Directive 2 (PSD2), require all institutions to offer secured data sharing, data protection, security of payments, and customer consent. PSD2, applicable from 13 January 2018, provides the legal foundation to make electronic payments within the European Union as easy, efficient, and secure as possible. Moreover, it seeks to open up payment markets to new entrants, leading to a more competitive environment translated in better choices and lower prices to consumers. In Spain, the PSD2 was implemented by the Real Decreto-Ley 19/2018, on payment services and other urgent measures in financial matters, which will mean a before and after for the sector of finance-related technology companies.

Additionally, Regulation (EU) 2015/751, puts a cap on interchange fees for card-based transactions between financial institutions, expecting to lower the merchants' costs of accepting debit and credit cards (EBA, 2019).

Even though the GDPR already covers some of the data protection issues arising from Fintech, additional or refined regulation may be required in areas such as the use of artificial intelligence and distributed ledger technology, or in the general trend towards the gathering of data from a broader set of parties (KPMG, 2019).

When it comes to alternative finance such as P2P lending, where digital platforms connect those in need of financing with investors, fintech companies do not undertake the risks that financial institutions do, and the speed of execution is better than theirs. As a result of the financial crisis, capital requirements for banks have been tightened, and that is giving a competitive advantage to Fintech firms able to operate without those constraints. The Security and Exchange Commission (SEC), responsible for the investing side of P2P lending platforms in the US, forbids P2P platforms from crediting the loan directly to the lenders. Subsequently, American P2P lending platforms do not operate as real matching platforms. The lending platform requests a financial institution to originate a loan from the platform to the borrower. The lender becomes a creditor to the platform the moment the platform issues a debt security to it. Until platforms register with the SEC, they are only allowed to accept accredited investors (Nemoto, Huang, & Storey, 2019).

2.4. BANKS' INCOME, ANALYSIS

To see how much the Fintech industry is going to affect banks' income, we are going to analyze the 2019 and 2018 Income Statement of both a national and international bank, Bankia and Bank of America.

2.4.1. Bankia

Bankia is a Spanish bank based in Valencia and Madrid, founded on December 3, 2010, in the process of restructuring the Spanish financial system.

The company, which operates mainly through retail banking and commercial banking segments, provides products such as direct salary deposits, mortgages, time deposits, credit

cards, insurance, investment funds and pensions, and other asset management services. Bankia also offers commercial banking, corporate banking, and capital markets services. On December 31, 2017, Bankia S.A. operated through a network of 2,423 branches and 6,086 ATMs, mainly serving individuals, independent professionals, clients of great heritage and companies, as well as micro, small, and medium enterprises.

Regarding its financials, as we can see in the consolidated financial statement shown below, most profits of the corporation come from interests, with a total Net Interest Income of 2,028,596,000 euros by the end of 2018 and 1,989,316,000 by the end of 2019. A -1.94% growth rate. This figure is the difference between the revenue coming from assets — loans, mortgages, and securities — and the liabilities' interest costs, such deposits in checking and savings accounts, and CDs. As we can see, their Interest income has dropped from 2,471,354,000 to 2,457,957,000, while the interest expenses have risen from 442,758,000 to 468,641,000 from 2018 to 2019.

On the other hand, in 2018, Bankia earned a total of 1,042,062,000 euros in fees and commissions, while in 2019, that number increased slightly to 1,058,368,000, a 1,565% increase from the previous year. What is interesting to see is how fees and commissions expenses went up from 78,090,000 to 82,539,000 from 2018 to 2019, a 5,697% rise in income expenses. As explained above, these fees come from interchange fees, account fees, ATM fees, brokerage commissions, foreign exchange service commissions, etc. This negative impact may be related to new competitors in the market, and the use of new technologies in a more efficient way, as we will analyze later.

FIGURE III. CONSOLIDATED FINANCIAL STATEMENTS 2019. BANKIA

BANKIA, S.A.			
Income statements for the years ended 31 December 2019 and 2018			
(Thousands of euros)			
	NOTE	2019	2018 (*)
Interest income	26	2,457,957	2,471,354
Financial assets at fair value through other comprehensive income		143,279	233,106
Financial assets at amortised cost		2,187,680	2,249,915
Other interest income		126,998	(11,667)
(Interest expenses)	27	(468,641)	(442,758)
(Expenses on share capital repayable on demand)		-	-
A) NET INTEREST INCOME		1,989,316	2,028,596
Dividend income	28	234,890	411,016
Fee and commission income	29	1,058,368	1,042,062
(Fee and commission expenses)	30	(82,539)	(78,090)
Gains or (-) losses on the derecognition in financial assets and liabilities not measured at fair value through profit or loss, net	31	288,776	399,874
Financial assets at amortised cost		71,247	1,539
Other financial assets and liabilities		217,529	398,335
Gains or (-) losses on financial assets and liabilities held for trading, net	31	26,466	48,036
Reclassification of financial assets out of measured at fair value through other comprehensive income category		-	-
Reclassification of financial assets out of measured at amortised cost		-	-
Other gains or (-) losses		26,466	48,036
Gains or (-) losses on non-trading financial assets mandatorily at fair value through profit or loss, net	31	905	(429)
Reclassification of financial assets out of measured at fair value through other comprehensive income category		-	-
Reclassification of financial assets out of measured at amortised cost		-	-
Other gains or (-) losses		905	(429)
Gains or (-) losses on financial assets and liabilities designated at fair value through profit or loss, net		-	-
Gains or (-) losses from hedge accounting, net	31	(11,531)	(28,534)
Exchange differences [gain or (-) loss], net		15,455	14,735
Other operating income	32	55,302	57,101
(Other operating expenses)	33	(303,033)	(297,562)
<i>Of which: Mandatory provisions to welfare fund (only savings banks and credit cooperatives)</i>		-	-
B) GROSS INCOME		3,272,375	3,596,805

Source: Bankia Annual Report – Consolidated Financial Statements 2019

2.4.2. Bank of America

To have a better picture, let us analyze now Bank of America, a U.S. multinational banking and financial services company founded in 1998 with headquarters in Charlotte, North Carolina. It is the second-largest bank holding in the United States by assets, with a total of \$2.38 trillion and 66 million customers worldwide. Bank of America is a global leader in wealth management, corporate, investment banking, and trading. It has about 4,400 retail financial centers and more than 16,000 ATMs across 35 countries. It is composed of eight lines of businesses, which are Retail, Preferred and Small Business, Merrill, Bank of America Private Banking, Business Banking, Global Commercial Banking, Global Corporate & Investment Banking, and Global Markets (Bank of America, 2019).

FIGURE IV & V: CONSOLIDATED FINANCIAL STATEMENTS. BANK OF AMERICA

Table 1 Summary Income Statement and Selected Financial Data

(Dollars in millions, except per share information)	2019	2018
Income statement		
Net interest income	\$ 48,891	\$ 48,162
Noninterest income	42,353	42,858
Total revenue, net of interest expense	91,244	91,020
Provision for credit losses	3,590	3,282
Noninterest expense	54,900	53,154
Income before income taxes	32,754	34,584
Income tax expense	5,324	6,437
Net income	27,430	28,147
Preferred stock dividends	1,432	1,451
Net income applicable to common shareholders	\$ 25,998	\$ 26,696
Per common share information		
Earnings	\$ 2.77	\$ 2.64
Diluted earnings	2.75	2.61
Dividends paid	0.66	0.54
Performance ratios		
Return on average assets	1.14%	1.21%
Return on average common shareholders' equity	10.62	11.04
Return on average tangible common shareholders' equity ⁽¹⁾	14.86	15.55
Efficiency ratio	60.17	58.40
Balance sheet at year end		
Total loans and leases	\$ 983,426	\$ 946,895
Total assets	2,434,079	2,354,507
Total deposits	1,434,803	1,381,476
Total liabilities	2,169,269	2,089,182
Total common shareholders' equity	241,409	242,999
Total shareholders' equity	264,810	265,325

Noninterest Income

Table 2 Noninterest Income

(Dollars in millions)	2019	2018
Fees and commissions:		
Card income	\$ 5,797	\$ 5,824
Service charges	7,674	7,767
Investment and brokerage services	13,902	14,160
Investment banking fees	5,642	5,327
Total fees and commissions	33,015	33,078
Market making and similar activities	9,034	9,008
Other income	304	772
Total noninterest income	\$ 42,353	\$ 42,858

Source: Bank of America (2019). Annual Reports & Proxy Statements

As we can see above, the Net Interest Income have risen from 48,162,000,000 to 48,891,000,000 from 2018 to 2019, a 1,514% increase.

Meanwhile, from the noninterest income, in 2019 a 77.97% came from fees and commissions from card income, service charges, investment and brokerage services, and investment banking fees. It is interesting to point out that the total noninterest income has dropped by -1.18%, from 42,858,000,000 in 2018 to 42,353,000,000 in 2019 and the total Net Income has dropped from 28,147,000,000 in 2018 to 27,430,000,000 in 2019, a negative growth rate of -2.55%.

These figures are interesting to consider because it is already showing a negative trend that is going to get much deeper due to the COVID-19 economic recession. Part of the damage, even if small, could be on the interest revenues, suffering a reduction in the demand for those services due to a greater offer in the Fintech industry, as we will see below.

Besides, Fintech companies may have a more noticeable impact on the banks' revenues related to fees and commissions. As we can see in Figure V, Bank of America, for example, charges fees for card income, services charges, investment and brokerage services, or investment banking fees. Some other widespread fees charged by banks are in Foreign Exchange Services, Interchange, ATM, and Account fees. As we explained above, Fintech startups focus on specific parts of the Banks' business models and attack those earnings like piranhas, trying to scratch income by a thousand cuts.

However, as the Fintech industry is young and in a growing stage, it cannot be stated that this negative trend in banks' earnings is precisely due to the Fintech impact. Even though trends are showing that the Fintech sector is gaining weight and popularity, it is too soon to state a significant correlation between a negative growth rate of Bank of America from 2018 to 2019 and the growth of the Fintech market. It is interesting the fact that Bank of America has only six fintech companies in its portfolio, investing less in this industry than Goldman Sachs, Citigroup, JP Morgan, Morgan Stanley, or Wells Fargo (even though it is the second-largest bank by assets from all those), which could be hurting its growth.

2.5. HOW MUCH WILL FINTECH COMPANIES HARM BANKS?

Once observed that most banks' profits come from interests and commissions, how much would they be affected in case someone else can give the same service cheaper or even for free to the client?

As we have seen, Fintech companies can have a significant impact on banks. Let us analyze how some existing companies would scratch income from these corporations.

In terms of interests, some Fintech startups that are taking clients from traditional banks are:

- LendingClub, founded in 2008 in California, is a peer-to-peer lending company that has transformed the way people access to credit, bringing borrowers and investors together directly, without bank intermediation. Their mission is helping millions of people take control of their debt, grow their small businesses, and invest for a better future. Individuals can get up to \$40,000 in personal loans, and companies can borrow between \$5,000 and \$500,000, both at a low fixed rate. LendingClub was the first P2P lender to register an Initial Public Offering with the Securities and Exchange

Commission (SEC) in 2014. It raised almost \$900 million in the largest U.S. tech IPO of 2014. Their goal, as stated in their website, is “transforming the banking system into a frictionless, transparent and highly efficient online marketplace, helping people achieve their financial goals every day.” (2020).

- Lending Home is a technological company founded in 2013 that covers every stage of the loan process. It simplifies how mortgages and loans are issued and offer competitive pricing, monthly payments per performing loan, volume-based bonuses, and competitive rates for the clients. Lending Home gives accredited investors an immediate cashflow on residential mortgage investments, with a minimum investment of \$50,000. They offer mainly bridge loans for fix-and-flip residential rehab properties but also has a test program in place to potentially offer consumer home loans, an online alternative to traditional bank mortgages. Since its foundation, the company has funded over 3.5 billion dollars’ worth of loans across 15,000+ projects.
- EarnUp is a consumer-first platform that automates loan payments. Their goal is helping anyone frustrated managing their debts and improving their wellbeing. EarnUp puts a few dollars aside for loans when consumers can afford it — then allocates funds the way that gets consumers out of debt faster. It scratches income from banks reducing loans late payments. Credit card late fees cost Americans \$3B each year. They already help 200 million indebted Americans pay their \$12-trillion in outstanding loans. “Interacting with your lenders is a horrible experience,” says Nadim Homsany (2016), EarnUp’s co-founder. “The system is often unnecessarily confusing, making it very hard for people to make payments.” The app is continuously finding small occasions to accelerate people’s loan payments ending debts faster. The company states that 94% of its clients decide to increase their monthly payments, which help them save around \$20,000 in interests.
- Summer is a Fintech platform that helps students to pay their loans. The app tracks the loan and maximizes the savings with a customized repayment plan. Their sophisticated algorithm saves borrowers thousands of dollars, affecting the income of banks in this field.

Focusing now on fees and commissions, we can also see Fintech startups changing the rules of the game and fighting for those earnings directly.

- Chime is a fast-growing challenger banking company in the U.S., with over 4M accounts and no physical branches. As they believe that everyone deserves financial peace of mind, their mission is building a new kind of bank account that helps members get ahead by making managing money easy. Chime does not profit from direct commissions to their clients but from a small interchange fee charged to the merchant every time a user uses their Visa debit card.
- Simple was founded in 2009 and offers free online checking and savings accounts designed to be used mostly on users' smartphones. It comes with a Visa debit card and excellent mobile banking tools. There is no monthly maintenance fee, no minimum balance requirement, no overdraft fee, and no funds transfer fee. BBVA bought it in 2014 as a strategic move for \$117 million (Alden, 2014).
- N26 is a new online bank account that offers customers free transfers, pay internationally without commission, and withdraw free cash five times a month. Moreover, clients can track their expenses with statistics to receiving an up-to-date overview of current expenses and ways of saving money. N26 already has more than two million clients in twenty-four countries.

Regarding Brokerage Commissions, some examples of these potential competitors are:

- Robinhood started in 2013 as a stock trading application with a peculiarity: to offer trading services to its customers without any commission. As their cofounder Tenev defends, "Robinhood's zero-commission model has unlocked the ability for every American, not just large institutions, to participate in a variety of investment strategies that were previously economically unfeasible." 75% of their income is earned thanks to their premium account -Robinhood Gold- which gives users have additional options such as 'trading' after market hours. The app, with over 4 million active users, affect directly to the brokerage commissions that banks charge for their trading services.

- Betterment is a Robo-advisor platform where investors can create and manage their investment portfolios online. The company has under management more than \$10 billion in assets and offers a wide range of online services, such as two investing accounts, tax-loss harvesting features, and competitive management fees. The standard account is Betterment Digital, where users with balances under \$100,000 can manage their portfolios with an annual management fee of 0.25%. Also, users receive messaging support of a financial advisor. On the other hand, Betterment Premium charges users with account balances of at least \$100,000 a 0.40% fee. Not only users get phone access to Certified Financial Planners (CFPs) but also to a user interface, a tax-loss harvesting, and mobile app features. Betterment Checking has no monthly maintenance fees, no overdraft fees, no minimum balance, and ATM fees are reimbursed.

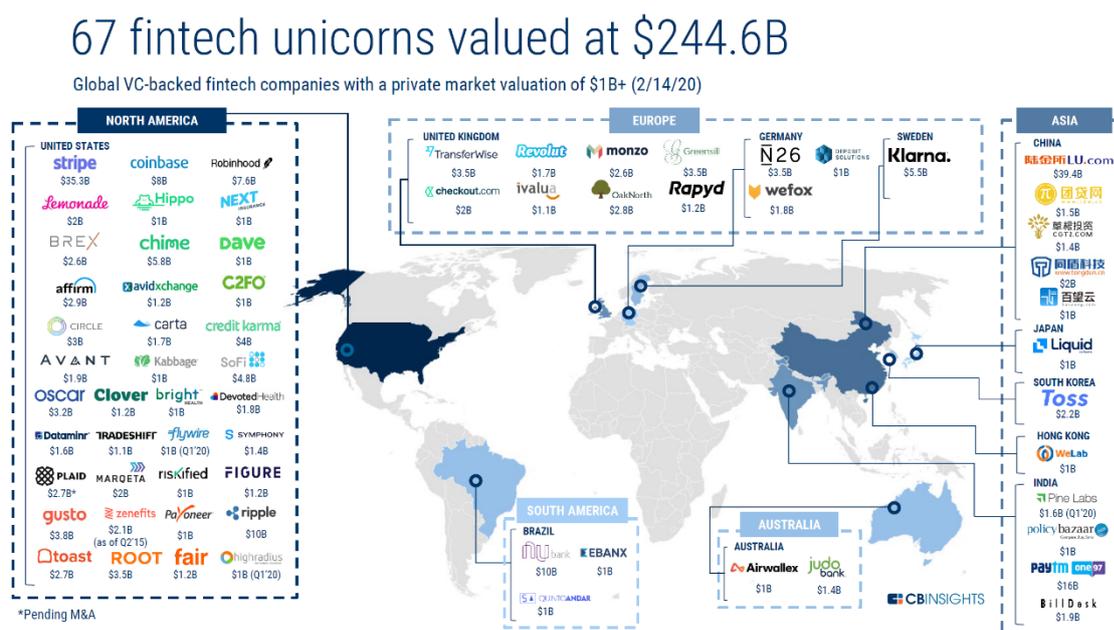
In connection with the Foreign Exchange Service fees, some startups have appeared to revolutionize the industry:

- Revolut allows customers to exchange currencies at interbank rates instantly, send money through contacts, and spend with a multi-currency Master Card. They give their clients up to €200 a month in international ATM withdrawals for free. Anything over €200 attracts a 2% fee. Opening an account takes minutes, and they already have more than 8 million users.
- TransferWise allows users to send money internationally with the lowest possible real cost, using only real exchange rates and small non-hidden fees. TransferWise is now Europe's most valuable Fintech start-up, with a \$3.5 billion valuation and more than 5 million customers
- Paypal is a service that enables users to pay, send money, and accept payments worldwide. It uses data encryption and anti-fraud technology, keeping users' information secure and reducing online fraud's risk. Moreover, PayPal accounts can be used to shop with millions of merchants and sellers around the globe wherever there is a PayPal logo (Paypal, 2020). Founded in 1998 and with two types of accounts; personal or business, it has a market cap of more than \$125 billion and, by the end of 2019, there were 305 million active PayPal accounts worldwide (Clement, 2020) facilitating 9.9 billion transactions worth \$578 billion in total payment volume in 2018.

The company makes money thanks to transaction fees, International payment commissions, and other services offered.

According to CB- Insight (2020), there are a total of 67 VC-backed fintech unicorns worth a combined \$244.6B by the end of 2019.

FIGURE VI: FINTECH UNICORNS



Source: CB-Insights. (2020). Future of Fintech 2020.

3. SUSTAINABLE GROWTH IN THE LONG TERM

3.1. MAIN CHARACTERISTICS

The traditional meaning of Sustainable growth is the realistic and achievable growth that a company or economy could maintain. It is a business strategy to expand revenue developing new markets or services from ongoing operations (Hall, 2000).

However, nowadays, this term has received a meaning more related to the environment, defining it as the economic growth achievable in the long term without creating excessive pollution or using up all the non-renewable resources.

In this section, we will examine both fields to understand more accurately how technology is affecting sustainable growth in the long term.

3.2. HOW TECHNOLOGICAL ADVANCES AFFECT SUSTAINABLE GROWTH

3.2.1. Business Sustainable Growth

Technological advances affect many aspects of companies such as cost reduction, efficiency and productivity, and effective marketing.

In the past years, marginal production costs of technology have been reduced to almost zero, accelerating the diffusion of such technologies while stimulating development and innovation. Those costs have been reduced by cloud-based computing and open-source software (United Nations, 2019). While the cost from storing one gigabyte of data in the cloud on Amazon Web Services fell from \$19.00 in 2000 to \$0.16 in 2011, it has fallen to less than \$0.03 in 2016 (Google Cloud, 2019). The Cloud computing pricing model benefits companies because they only pay what they need, saving companies from paying for software that is not used. Moreover, as clients can choose to cancel the subscription anytime considered convenient, the financial risk of choosing that specific software lessens considerably.

Many companies are implanting a CRM system, an acronym that stands for Customer Relationship Management, as another way of reducing costs. CRM is any tool, strategy, or process that helps businesses to organize better their access to customer data (SalesForce, 2020). Companies such as Oracle, Salesforce.com or Microsoft, offer this service, and in 2008, 70% of 1,500 companies surveyed by CSO Insights, a research firm that specializes in benchmarking CRM, used the service (Dickie, 2008). CRM software can help businesses eliminate misplaced invoices saving time and money for the companies. Basic enterprise software enables companies to automate back-office functions, such as record keeping, accounting, and payroll.

Not only these technological advances have benefited existing companies, but they also have led to a sharp reduction of entry costs for business creation (Asaolu, 2017). Besides, technology allows small businesses to reach new markets instead of just selling their goods or services in the local market. Retail websites and partnerships with more prominent companies like Amazon increase their target market and scalability. New technologies drop geographical

and cultural barriers, making companies' websites available for searches all around the world. Moreover, emerging technologies give companies access to data related to their sales. The data can be used to understand better the type of customer the company has and their needs, categorizing them by demographics, preferences, or affinities for other types of products. Creating profiles for target customers increases the chances of reaching them using better and more accurate marketing campaigns (Gross, 2013). Because technological advances have revolutionized marketing, new tools and techniques are transforming traditional marketing into digital marketing and continuously enrich and simplify how marketers and their audiences interact (Jayaram, Manrai, & Manrai, 2015).

Technology is giving marketers the capacity to customize processes reaching a bigger target audience and increasing the models of market segmentation and customization. It influences customer relationship management to the extent that building relationships with clients has become more accessible and effective (Rust & Petersen, 2006).

One of the main goals in the history of companies has always been increasing productivity and efficiency. The Cambridge dictionary defines the term efficiency as "the good use of time and energy in a way that does not waste any." The most significant step taken in history before our times was the industrial revolution between 1760 and 1840. Production efficiency improved extraordinarily with inventions such as the locomotive or the steam engine, which dramatically reduced the time it took to manufacture products, increasing production and growth of companies and economies. Nowadays, efficiency in the workplace is being enhanced by technological advances. Technology improves communication and connectivity across the business, including employees working remotely or faster response between different branches, which can be in different countries. As Hackenberg states, "By committing to widening the diversity of the workplace, fostering skills, introducing flexible working, and even improving premises to make them greener and healthier places to work, corporations can attract and retain a talent pool that mirrors their wider customer base." (2019).

As well, the relevant information is capture, such as customer details, in the simplest, time-efficient way, bettering customer support, and the relationship with clients. As technology automatize many processes, the time put in everyday tasks by employees has been cut down drastically, optimizing their energies to be used for more complex and vital tasks, which leads to better results and growth opportunities. Further, it helps companies track progress towards their goal's completion, making companies' strategies more achievable.

3.2.2. United Nations Sustainable Development 2030 Goals

The United Nations Sustainable Development Goals for 2030 are:

FIGURE VII. 2030 SUSTAINABLE DEVELOPMENT GOALS. UNITED NATIONS.



Source: United Nations. (2015). Transforming Our World: The 2030 Agenda For Sustainable Development.

The 2030 agenda requires a high engagement by Science, technology, and innovation (STI). While technology can be identified in SDG17 as an essential means for sustainable development, it also plays a vital role in SDG9, which specifies innovation as an instrument for revamping economies, tackling vulnerability, building resilience, and attaining prosperity. Technology offers governments and businesses the opportunity to achieve more with limited resources while reducing costs and risks (United Nations, 2018). Back in 2015, all 192 United Nations member states came together to establish 17 ambitious global goals to attain for 2030. We just entered the decade of action, from 2020 to 2030.

So, how those technological advances directly contribute to the achievement of the 2030 Agenda?

SDG 1. No Poverty

First of all, improving real incomes. Technology increases productivity in the workplace, enabling more effective communication while reducing the amount of time spent on unnecessary and now automated tasks. It strengthens and enhances teamwork connecting employees in real-time from anywhere around the world, and it reduces the costs of goods and services by automating processes.

The growth principle in neo-classical theory defends that the Gross Domestic Product (GDP) per capita increases with technological advances, causing real GDP to grow. A research study by McKinsey & Company claimed that wireless had a positive impact on the GDP. Benefits came mostly from productivity gains thanks to their mobile phones' usage (Enriquez, Schmitgen & Sun, 2007). As GDP grows, it is assumed that GDP per capita will follow the trend and grow too. Everyone in the chain will benefit, having a positive effect reflected in the improvement of the population's standards of living.

Schumpeter, the first economist that defended the positive impact of technology in the economy, argues that technology creatively destroys weakening and unnecessary sectors and develop new industries in the marketplace, causing the economy to grow and affecting positively millions of people around the globe (Çalışkan, 2015).

SDG 2. Zero Hunger

With new technologies rapidly transforming our society, disruption allows attaining other goals such as the SDG2 "zero hunger." Artificial intelligence, sensors, robotics, and synthetic biology are improving more drastically crop productivity and resiliency while optimizing food distribution. NRGene, for example, uses machine learning and big data to offer commercial companies the opportunity of maximizing, with better results in record time, their agricultural yield. Phytech, on the other hand, optimizes crop production, saves water, and reduce risk with data analytics directly sent to farmers' smartphones (Herweijer & Kailash, 2019). Other organizations have also introduced blockchain technology for enhancing traceability. Walmart can trace through blockchain systems the origin of a "contaminated" item in seconds; with this capability, retailers can remove from circulation contaminated stock items immediately knowing the exact source where it comes from (DiChristina & Meyerson, 2019).

SDG 3. Good Health and Well-Being

Human medicine, along with healthcare information, the SDG3, is also positively affected by technological advances. Since 2010, healthcare startups have attracted \$145 billion invested in more than 18,000 startups. AI systems attain earlier and higher-performance diagnostics for disease detection. Longgenesis, for example, uses AI and blockchain-based platforms to store, manage, and trade health data and medical records. Healthcare institutions can share through legitimate ways biomedical data for research.

SDG 4. Quality Education

Another positive result of technology is the impact on education. The biggest problem of education in developing countries are teachers, few, ignorant, and most times, missing classes. Even though the technology is not a substitute for a well-qualified teacher, it can alleviate the problem (The Economist, 2018).

Tusome, meaning “let’s read” in Kiswahili and founded in 2015 between the United States Agency for International Development (USAID) and the UK Department for International Development, have the objective of increasing the learning outcome for about 7 million children in grades 1, 2, and 3 in more than 22,600 public schools, 5,027 private schools, and 1,500 alternative basic education institutions in urban slums of Kenya (Tusome, 2020). The project has support officers in all 47 counties with innovative teaching methodologies providing instructional support to teachers.

On the other hand, Mindspark is a computer-based, online self-learning tool focused on math and developed in India that makes students learn following a learning path adapted to their level. Mindspark software has been used by over 400,000 students, has a database of over 45,000 test questions and the price is a subsidized fee of INR 200 (USD 3) per month charged by the centers. A disruptive feature of their adapted learning path is that the software identifies patterns of student errors and targets content to strengthen those concepts. The platform can be used in class or through self-guided study, it is available for computers, smartphones, and tablets and can be used both online and offline (Muralidharan, Singh & Ganimian, 2017).

Finally, One Billion software has the most challenging goal, teaching children in the absence of any teacher. According to their website, One Billion is working across two villages in Kenya. It helped in 2018-2019, around 500 children between 5 and 11 years old. Mothers

act as custodians of the devices, which have access to the learning course. It is working in other countries too such as South Africa, Uganda, India, Ethiopia, Brazil, or Cambodia.

SDG 5 & 10. Gender Equality & Reduced Inequalities

The fifth and tenth goals of the 2030 Agenda fight against inequalities present all around the world. While the McKinsey study “Delivering through Diversity” suggests that there is a positive correlation between inclusion in the workplace and company financial performance, we can easily see that in this world, women are less likely to reach the top-level positions. According to the report “Gender Equity Insights 2019: Breaking through the Glass Ceiling,” in 2018, women accounted for 32.4% of senior managers, 29.0% of executives, 29.0% of key management personnel, 16.8% of CEOs/Heads of Business (Duncan & Cassells, 2019).

Advances in technology play an essential role in inclusiveness, offering new tools to promote diversity and inclusion initiatives inside the workplace. SAP, for example, has developed “Business Beyond Bias,” a technological initiative that aims to eliminate companies’ biases. With Artificial Intelligence (AI), they eliminate any type of sexist language in the advertisements of job offers, and thanks to Machine Learning techniques, the most competent candidates are found, adjusting salaries to the level of difficulty of tasks and responsibility, independently of gender. According to SAP, Business Beyond Bias allows them to visualize the diversity of gender in the different departments and compare the data with the market.

Meanwhile, technology gives voice to women in conflict areas all around the world, reducing gender inequality and building peace. An example of this is the protest movement against Sudan’s government. Women, unable to join the main protest in the street, recorded and shared their support to the movement on social media. A private Facebook group evolved to bring to light the abuses women were facing during the protests while raising funds for the revolution. Even though the Sudanese government tried to block social media in response, women hid their locations through a Virtual Private Network (VPN) and continued the protest safely (Robertson & Ayazi, 2019).

SDG 7 & 13. Affordable and Clean Energy & Climate Action

Finally, and focusing now on the relationship between sustainable development and the environment, the SDG7 defends affordable and clean energy. The United Nations states that there are nearly 800 million people lacking access to reliable and affordable electricity.

According to the Energy Information Administration (EIA), electricity generated by renewables has doubled in the US in the past ten years (DiChristina & Meyerson, 2019). Moreover, rapid advances in new technologies such as Lithium-ion batteries, mean that renewable energy mini-grids have the potential to provide a cheaper solution to power for 290 million people

Also, emerging technologies can accelerate electrification, including areas in Africa with fewer centralized network power grids. In Kenya and Zambia, for example, the startup Powergen has installed solar-powered mini-grids projects with battery storage, providing electricity to rural and more impoverished areas offering cheap rates.

Smart monitoring and active management of energy systems can be achieved through the combination of AI and IoT technologies, which have the potential to optimize decentralized energy systems worldwide. Some uses of these new technologies are optimizing energy use by automating price responsiveness to market signals; or improving operational efficiency while reducing waste (Herweijer & Kailash, 2019).

3.3. CAN TECHNOLOGY REDUCES FINANCIAL EXCLUSION?

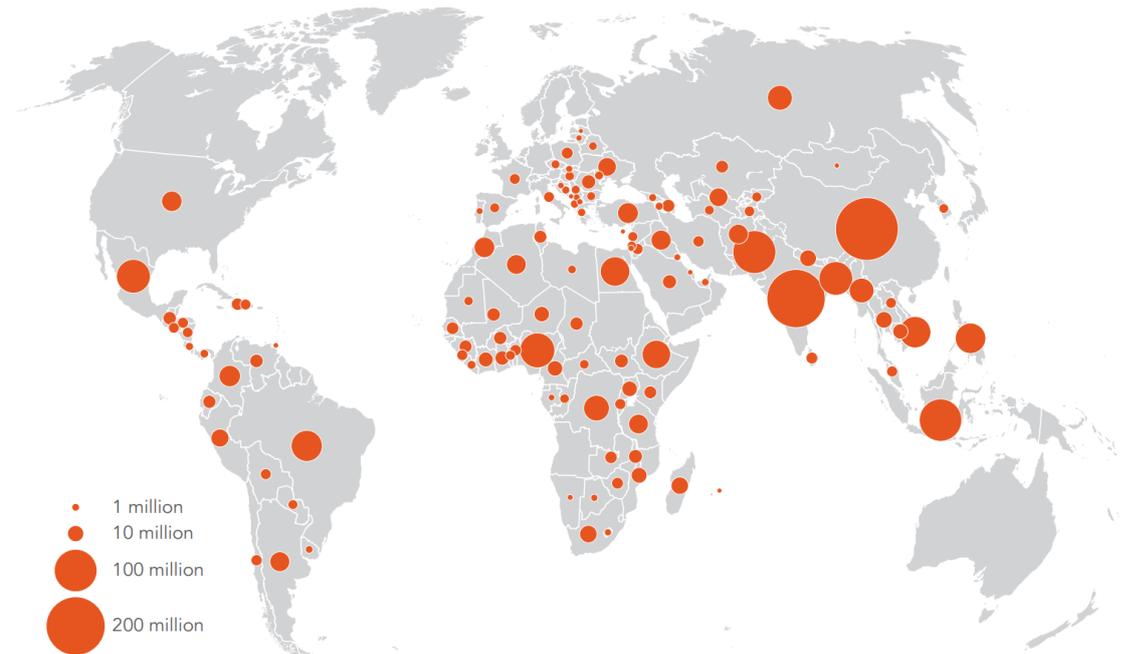
The term financial inclusion can be defined as an economic state where people have access to appropriate, desired financial products and services. However, not everybody has that privilege, as the Treasury Select Committee states, many people are unable to access suitable financial products and services. They face barriers in opening and operating bank accounts, obtaining credit, or lack the possibility of using other services such as pensions or insurances. Mohan (2006) defines financial exclusion as the lack of access by certain segments of society to appropriate, low-cost, fair, and safe financial products and services, leaving people at the mercy of predatory practices from unregulated credit providers. Financial exclusion makes the life of many people vulnerable and reinforces social exclusion.

The GSM Association estimated that in (2009), 1 billion people in developing countries, who owned a mobile phone, did not have access to financial services. In 2017, around 1.7

billion adults remained unbanked around the world. The world's largest unbanked country is China, where 225 million adults do not have access to a bank account. India follows with 190 million, and with Pakistan (100 million), Indonesia (95 million), Nigeria, Mexico, and Bangladesh sum half of the world's unbanked population.

FIGURE VIII. ADULTS LACKING A BANK ACCOUNT IN THE WORLD.

Globally, 1.7 billion adults lack an account
Adults without an account, 2017



Source: Global Findex database (2017).

Women represent 56% of the unbanked adult population with an estimate of about 980 million who do not have access to financial services.

In terms of education, 62 percent of unbanked did not have access to high school or post secondaries education. In some economies, these figures are even more dramatic; 92 % of unbanked adults in Ethiopia do not have access to more than primary school. Meanwhile, those numbers do not vary much in Tanzania (86 %) or Pakistan (75 %). It is interesting to note that only 38 % of the population worldwide is unbanked after completing high school or postsecondary education.

Why 31 percent of adults in the world remain unbanked? Global Findex ran a survey in (2017) asking unbanked adults about the reasons for not opening a bank account. The most

common reason was the lack of enough money, followed by the belief of not needing one. The cost of opening an account was another significant barrier, cited by 26 percent of the surveyed worldwide and by almost 60 percent in Brazil, Colombia, and Peru. Some other barriers were distance, 22 percent said that financial institutions are too far away, and lack of documentation required.

Could the expansion of mobile phone use affect positively to reduce financial exclusion? As Leonard Waverman, professor at the London Business School, points out “A developing country that had an average of 10 more mobile phones per 100 population between 1996 and 2003 would have enjoyed a per capita GDP growth that was 0.59 percent higher than an otherwise identical country” (2005).

One benefit of storing money on a mobile phone is that users get rid of the need to carry around cash. Paying bills or transferring funds becomes safer and faster. Different models of mobile banking are going to be examined below. M-Pesa and NuBank.

The Mobile Network Operator’s (MNO) Centered Model saw an opportunity in the mobile banking sector to add services for the unbanked while solidifying and expanding their customer base. Roughly 10 percent of Kenya’s population had access to formal financial services in 2008, and 50 percent were below the poverty line (CIA, 2018). At that time, even though a small part of the population had bank accounts, mobile penetration was 50% in March 2010 (Safaricom, 2010), and the GSMA, in their (2009) annual report, forecasted to reach 101 % by 2012.

Safaricom, a subsidiary of Vodafone who controlled 79% of the mobile market share in 2009 (Safaricom, 2010), started exploring the idea of creating an app that would bring banking services to the unbanked via mobile phones. However, banking services could only be conducted by institutions that hold a banking license. Instead of trying to partner with a bank, they position themselves as a company that transported money, using the tagline “Send money home” (Cull, 2010).

That way, M-Pesa, was conceived as a mobile money-transfer service rather than a mobile banking service falling inside of the law. The company did not earn any interest in the money held in the accounts. They only facilitated transactions. The “M” in the name refers to “mobile,” and the term “Pesa” means in Swahili “money.” The service launched in March 2007 and all Safaricom users could register to M-Pesa for free. To get enrolled in the platform, customers should go to an M-Pesa distribution agent, located in both urban and rural areas, and

open an account giving an original identification document. The process aimed to take less than five minutes, and as stated above, both registration and deposit were free of charge. Services included person to person transfers (\$0.40 commission fee), deposit funds, deposit cash, withdraw money (between \$0.33- \$2.25), buy Safaricom airtime, and pay bills (\$0.40 fee). Customers used the service not only to send money to other users but also to pay other services such as taxis or buses (Ragan & Lee, 2012)

M-Pesa was one of the first companies that showed the potential of the Fintech industry. By 2012, the service had approximately 17 million users illustrating that the fintech target market includes a lower socio-economic demographic group and, with over 90 % mobile phone penetration in Kenya in 2016, the impact it could have on the life of millions of economically excluded people (Blythin-Hammond - Van Cooten, 2017).

The service did not only benefit customers but also made 9 % of Safaricom's total revenues for the fiscal year of 2010. Moreover, Safaricom attributed M-Pesa their significantly lower than the industry average churn rate, only 27.2 % (Safaricom, 2010)

In 2008, Vodafone decided to expand markets and launched similar services in Afghanistan and Tanzania, with an unbanked population at that time of 95% and 97%, respectively (GSMA, 2009). In Tanzania, the per capita GDP was lower, and a higher percentage of the population was unbanked compared to Kenya. However, it has a rough first year with just 280,000 subscribers. The company reacted including some new services to M-Pesa such as adding bill payment and microfinance institutions (MFI) loan repayment, increasing the number of agents, and changing the transaction fee structure. As a result, by November of 2009, monthly transactions totaled \$12.8 million, the number of subscribers had risen to more than one million, and the number of agents to more than 2,000 (more than 100% increase compared to the previous year) (Rotman, 2009).

Nowadays M-Pesa numbers are impressive, by the end of 2019 fiscal year, the company has over 37 million active customers and almost 400,000 active agents operating across seven countries: the Democratic Republic of Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique, and Tanzania. With 11 billion transactions carried out in 2019, M-Pesa significantly reduces potential risks of burglary, street robbery, and corruption. It also helps governments to collect taxes and disburse social security payments and enable companies to collect payment from clients as well as allowing charities to send money to thousands of beneficiaries at once. (Vodafone, 2020).

The other startup to take into account in our research is NuBank, a Brazilian financial institution launched in 2014, offers no-fee accounts and credit cards, and it is open within a few minutes after answering a couple of simple questions via the app. Véllez, the founder, saw a vast opportunity to bring 55 million unbanked people in Brazil access to banking services. Their first product launched was a no-fee, low-interest international Mastercard credit card managed by a mobile app. In 2018, and once received a special banking permit from the Brazilian government, they started NuConta, a savings account. One year later, they have presented a personal loan product.

The company, whose original goal was a million customers in their first five years, had signed up nearly 20 million users by the end of 2019 and has a 50% share of all new credit cards issued in Brazil. As they do not have any physical branch, their costs are low. Revenue comes from interest and from interchange fees, which is an average of 1% per transaction. Even though they are not profitable yet, losses are being narrowed each year. Their short-term plan is focusing on expansion rather than in profits. As Véllez states "For the next five years we're focused on Latin America, but over a very long-term horizon, we think emerging markets are very interesting — when you look at Nigeria, Indonesia, Vietnam, India, you find the same oligopoly structure," (Pepitone, 2019).

3.4. TRANSPARENCY OF TRANSACTIONS AND DATA PROTECTION THROUGH BLOCKCHAIN

The decentralization of the distributed ledger through blockchain means that the transactions are recorded in multiple locations, offering transparency through pseudonymity and irreversibility of records while being hacking resistant.

Blockchain-based applications can coordinate self-organizing activities in a secure and decentralized manner adding attributes such as privacy, where transactions are shared only with the members that need access to them. Over time, blockchain-based applications may be used to coordinate the self-organizing activities of individuals and institutions in a secure and decentralized manner (Wladawsky-Berger, 2019). According to Gartner (2017), the business value-add of blockchain will be over \$176 billion by 2025, and it will exceed \$3.1 trillion by 2030.

The mining process is the reason that promotes the security of the platform. Blockchain mining is the mechanism that makes the system secure and decentralized, enabling a peer-to-peer network without a central authority.

The ability to view public addresses giving access to transaction history, assets etc. without boundaries is what defines the transparency of transactions. As this degree of transparency had never been reached before within the financial system, it raises doubts and concerns in some industries (Ibrahim, 2018). On the other hand, the lack of transparency has affected financial institutions negatively at many points in history. The former Vice President of JP Morgan, Pang Huadong, believes that if blockchain existed before 2008, the financial crisis would not have happened. During the 2008 financial crash, he realized that this new technology could establish transparency and trust in the global economic system.

Alex Tapscott, the founder and CEO of blockchain advisory firm Northwest Passage Venture, and co-author of the book *Blockchain Revolution*, said in an interview for Quartz that:

“When it comes to financial stability, if regulators like the Federal Reserve or the People’s Bank in China, could get a window into the dealings of large financial firms and see the same shared ledger that the banks did, they would know whether or not too much risk was being taken in the system, whether or not there were liquidity crunches in the system, whether or not there were troubled banks or shadow banks that needed support or a slap on the wrist. You’d be able to have more information and a much clearer picture to do your job better. That ties into financial stability. If you’re connected to the same records as everyone else, then you don’t need all of the resources to go into the individual banks and vet their siloed transaction records to determine whether or not they’re acting within the law. And that could allow you to cut costs and do your job better. So in each role of the central bank, there’s an opportunity to do that job better.” (Kar, 2016).

Additionally, more than one billion people worldwide do not have a form of identification, being vulnerable to injustice and limitation of freedom. Blockchain technology could be used to protect their identities making the world fairer. Besides, financial firms can prevent loan fraud by introducing digital identities, ensuring that their customers are trustworthy and eligible for a loan, which could drastically lower the chances of default.

4. THE FUTURE OF THE FINANCIAL INDUSTRY

4.1. ARE BIG TECH COMPANIES A THREAT TO BANKS?

The five major technology companies, described by the term Big Tech, have the necessary resources to expand their operations by offering financial services to their customers. These companies, characterized by being founded as 100% technological based companies, differ from the Fintech mainly because they have huge capital, the most advanced technology, and a worldwide presence. The companies involved in this new concept are Facebook, Apple, Google, Microsoft, and Amazon.

Big Tech companies' objective is not to be regulated like banks and, for the banking system, the possibility of tech giants replicating the success of Alipay and WeChat in China, where money flows through digital systems without the need for banks, sounds like a nightmare. Alibaba Group Holding Ltd. created Alipay in 2004, letting customers lacking credit and debit cards, shop on its online marketplace. By 2019, they have reached 1 billion monthly active users. Meanwhile, Tencent Holdings Ltd. started WeChat in 2005, and by the number of Tencent's WeChat, active accounts have had a constant growth of 20 million users each quarter. In the most recently reported quarter, WeChat had over 1.15 billion monthly active users (Tencent, 2019). Alipay and WeChat Pay transactions totaled \$23.16 trillion in 2018, according to BigData-Research, and have 90% of China's third-party mobile payments market. Moreover, both companies are racing now to install at retail points-of-sale branded facial recognition screens. Making consumers pay by merely looking into screens will speed up sales and improve efficiency for both customers and retailers (Xie, 2019).

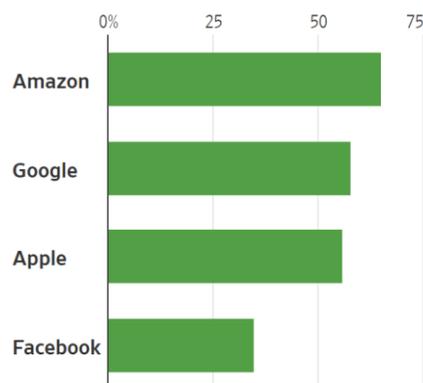
Amazon Cash, launched in April 2017, enables customers to deposit cash to a digital account through retail partners. In March 2018, press reports speculated that Amazon was discussing with several banks about the possibility of offering a checking account-type product. Bain & Co. surveyed a total of 6,000 participants about their willingness to open an Amazon bank account, and 65% of Amazon Prime users would try a free online bank account with 2% cashback on Amazon purchases. 43% of non-prime Amazon customers would try it, and even 37% from non-Amazon customers would give it a shot (Toit & Chervis, 2018).

The head of research at fintech consultancy 11:FS, Sarah Kocianski, affirms that bigtech firms are going to add services related to banking without entering entirely into the industry. "The headache of getting, and maintaining, a banking license would likely be considered too big a risk for these companies. Instead, they will continue to operate with licensed partners."

Google intends to introduce consumer bank accounts this year in collaboration with Citi and a California-based credit union. Apple Inc. introduced a credit card on 2019 partnering with Goldman Sachs, and Facebook is working on Libra, a digital currency. Caesar Sengupta, Google executive, said in an interview that their approach is partnering deeply with banks and the financial system, a slightly longer but more sustainable path. According to him, Google wants to bring value to consumers, banks, and merchants with banking services but without using checking-account users' financial data (Rudegear & Hoffman, 2019). Juniper Research, an analyst house that focuses on digital technology markets, argues that Google Pay aims to have 100 million users in 2020, while Apple Pay reached 140 million in 2018.

FIGURE IX: BIGTECH TRUST.

Break the Bank
 Percentage of consumers who would trust each of the big four tech companies to handle their finances



In a recent McKinsey &Co. survey, 58% percent of respondents said they would trust financial products from Google. A better result compared to Apple and Facebook, but worse than Amazon.

Source: McKinsey &Co.

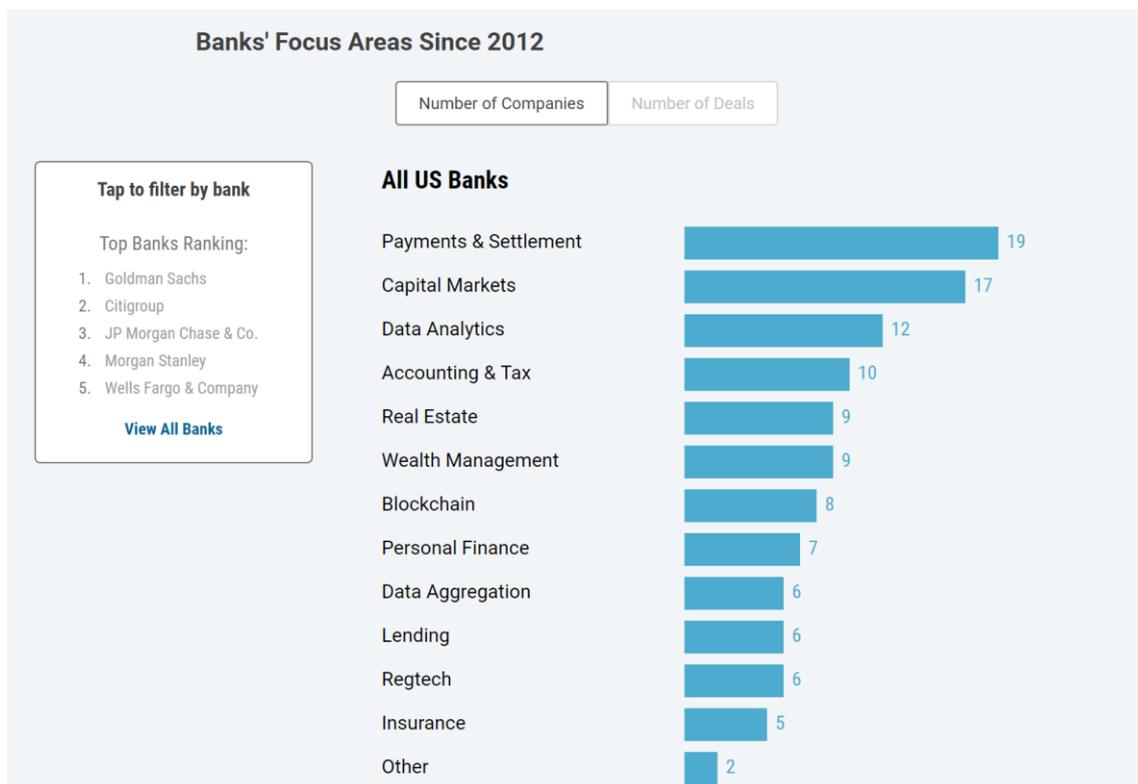
4.2. ARE WE FACING THE BIGGEST CHANGE IN THE FINANCIAL INDUSTRY IN HISTORY?

Yes. The financial industry has never changed as much and faster as in these last years. Banks know it; they cannot keep their monopoly as if nothing was happening.

Due to this new situation, big banks are actively investing in Fintech, trying to maintain their dominance in the industry. In 2018, U.S banks participated in 45 fintech deals, according to CB Insights. The most active investors in Fintech of all financial institutions are Goldman

Sachs and Citigroup. Goldman Sachs has focused the investments on payments and data analytics fintech — aligning with its strategy of scaling its consumer offering. Citi Ventures has backed fintech startups in fields like blockchain, capital markets, and payments, between others. In March 2019, City released its strategy to build a digital consumer payments business for institutions. Likewise, JP Morgan has invested primarily in capital markets and accounting startups, focusing on scaling its payment business while strengthening its capital market solutions.

FIGURE X: BANKS’ INVESTMENTS IN FINTECH SINCE 2012



Source: CB-Insights. (2020). Future of Fintech 2020.

In 2019, US banks participated in the equity investment of 24 fintech companies while in 2018, the number of startup deals backed reached 45, a 180% increase from 2017.

Bank of America Merrill Lynch (BAML) is working on a blockchain project to ease money transactions across borders. Hubert JP Jolly, global head of financing and channels in global transaction services, said that “When it comes to blockchain, we have one use case that we’re looking to roll out around cross-border payments, where we see benefits of blockchain around connectivity between banks.” (Weeks, 2019). Faisal Ameen, head of global transaction services in Asia Pacific, specifies that about 40% of the new tech investment goes to implant

fintech companies that offer last-mile solutions for end clients. The rest is mostly invested in artificial intelligence and robotics, trying to attain higher internal efficiency. Using machine learning, the bank is training the system to recognize errors and apply the correct codes for clients' ongoing payments. Furthermore, the corporation is investing around 30% of new tech investments in Blockchain, even though they admit that right now, blockchain “It’s not about zero returns, it’s about negative returns.” BAML is taking Blockchain seriously, according to intellectual property law firm EnvisionIP, it has applied for or received 82 blockchain-related patents so far. The investment in HighRadius, a Fintech enterprise software-as-a-service (SaaS) that uses Artificial Intelligence to automate receivables, is an example of a Fintech startup backed by the bank, which launched Intelligent Receivables to help big corporations match payments and invoices.

However, Bank of America is not investing as much as its U.S. competitors in the Fintech industry, which could be hurting the company’s growth, as we saw analyzing their Income Statement in section 2. As stated, Bank of America has only six fintech companies in its portfolio (even though it is the second-largest bank by assets on the list). The most significant investments that it is involved in are Bill.com, participating in the company’s \$38 million Series E., Kensho, an AI & Machine Learning Driving Essential Intelligence startup that has raised \$50 million in a Series B round, or Visible Alpha LLC, a new technology company that creates common platforms and languages for analysts’ financial models and forecasts, and that was formed in 2015 by Bank of America Merrill Lynch, Citi, Jefferies, Morgan Stanley, and UBS.

Goldman Sachs, ranked by CB Insight as the most active bank in Fintech deals, currently has in their portfolio 46 investments related to fintech startups. Some examples of these investments are Even Financial, a technology startup that connects the various entities in the financial services industry, and that raised a round of \$18.8 million in 2018 from Series A., Juno, a company that provides loans to the unbanked in Africa, secured a massive \$52 million investment led by Goldman to boost growth. Prodigy Finance, a UK-based intercompany lender that offers educational loans to international students attending top universities around the world, has secured \$1 billion in financial debt with Goldman’s participation. Square, which helps millions of sellers run their business from secure credit card processing, or Billtrust, a bill presentment and payment startup co-led by Goldman and Bain in a \$25M Series C deal.

Citigroup, ranked by CB Insight as the second most active bank in global fintech deals, invests in technological startups through Citi Ventures. They are mostly focusing on startups

related to Financial Services (Betterment, Plaid, Digit or CashForce), Data Analytics & Machine Learning (Second Measure, Anaconda, Datameer, or Feedzai.), Payments (Square, Ppro, Aquilon or Vivotech), Security and IT (Chef, Cylander, Tanium, or Kenna), and Property Technology (Reonomy, Roofstock, or Unison).

To see it more visually, Figure XI shows the investments on Fintech startups by the top U.S. banks.

FIGURE XI. WHERE THE TOP U.S. BANKS ARE INVESTING ON FINTECH

	Rank	Blockchain	Data Analytics	Insurance	Personal Finance	Wealth Management	Fin. Services Software	Lending	Payments & Settlement	Real Estate	Regulatory Technology	Supply Chain
	1	Digital Asset	KENSHC AXONI [PERSADO] CIRCLE DataFox visible.alpha	OSCAR	CompareAsia	motif FOLIO	SYMPHONY PLAID nav neyber	FinanceIT billtrust CADRE ACADIASOFT NYSHEX mo better DROIT nanoPay nmi Square Aquilon				
	2	Digital Asset	KENSHC AXONI [PERSADO] Chain visible.alpha Cobalt AYASDI r3 SELERITY		claritymoney Linkable	Betterment	SYMPHONY PLAID BlueVine TRADEIT F>ST PSY m D A Q InvestLab	C2FO Aquilon ACADIASOFT JUMIO vivo Square				
	3	Digital Asset	KENSHC AXONI		Dave	motif	SYMPHONY investcloud openfin Cloud9	PROPER LevelUp GOBARD Bill	ACADIASOFT			
Morgan Stanley	4		KENSHC visible.alpha	众安保险 ZongAn Insurance			SYMPHONY ERIS elem iCapital	陆金所 LU.com ACADIASOFT				
	4	r3	KENSHC AXONI ALT X visible.alpha				SYMPHONY F>ST PSY TRANSACTIS	DROIT				
	6	r3	KENSHC visible.alpha				SYMPHONY	Bill.com ACADIASOFT				
	7	r3						TRANSACTIS SECURE KEY				
	8	Chain						TRANSACTIS				
	8	r3						InstaMed				
	8	Digital Asset						TRANSACTIS				

Source: CBInsights (2018). Where Top US Banks Are Betting On Fintech.

Back in Spain, Bankia is trying as well to stay active in the Fintech industry. Creating the fund “Bankia Fintech Venture,” the entity plans to invest up to 20 million euros over five years in fintech projects. Ignacio Cea, the corporate director of Innovation and Cybersecurity, said that the fund would allow a significant number of startups "to make their projects a reality and to be able to collaborate jointly with the bank in the development of new services for customers." He admitted that a mutual collaboration between the bank and these new fintech startups is the best way to succeed in this changing market (Bankia, 2019). Moreover, Bankia Fintech by Insomnia is the first Fintech incubator and accelerator in Spain focused on the early-stage financial technology services, aiming at both national and international startups. As it was created at the end of 2019, Bankia does not have any fintech startup in the portfolio yet.

The leader of the Fintech market in Spain when it comes to financial institutions is BBVA. In 2018, the institution reached an agreement with Anthemis, a leader in the investment and creation of new financial technology companies, to establish a startup lab in London. The aim is for the new incubator to generate value by providing capital and resources to startup companies that respond to new user needs and attract the best entrepreneurs in the Fintech world. The BBVA Group's Open Innovation unit is responsible for forging new connections and alliances with Fintech entrepreneurs around the world. Its goal is to build agreements that can contribute to the development of new products and services for the bank.

However, these efforts may not be enough. The COVID-19 is disrupting the banking system hardly, and fintech companies could use it as an opportunity to gain market share. Barclays, for example, believes that Bankia will be the most affected Spanish bank by the COVID-19 crisis. Analysts at the entity expect the bank's profits to fall to 77% in 2020, 68% in 2021, and 49% in 2022. For the whole Spanish banking industry, Barclays has revised its valuations with an average cut in the profit forecast of 48% for 2020, 51% for 2021, and 33% for 2022 (Moreno, 2020).

4.3. WHAT DOES THE FUTURE OF THE FINANCIAL INDUSTRY LOOK LIKE?

As seen above, U.S banks are getting involved in fintech rounds and investing heavily in this new Fintech market. The two main reasons for this new trend are the potential for high returns and strategic partnerships. In terms of high returns, banks' investments are going to be mainly focused on future returns and exposure gain to emerging subindustries. Fintech startups

have higher exponential growth than many other industries, making it an attractive investment for banks with venture capital branches. In the Global FinTech Report elaborated by Price Water Housecopper in 2017, the biggest threat to banks in terms of customer retention was the Fintech focus on intuitive product design, ease of use, 24/7 accessibility, and faster services. However, they addressed that 63% of bankers see the rise of FinTech as an opportunity to expand products and services (Kashyap, Shipman & Garfinkel, 2017).

Banks need to innovate and simplify their infrastructures to become more efficient. Both banks and fintech have something to exchange that the other one is interested in. Partnerships between banks and fintech may be the best solution to the situation. Fintech operative systems offer specific services quicker to consumers, and if banks implement their methods, their infrastructure costs can be reduced drastically. Financial structure refers to a complex mix of technology systems, networks, applications servers, databases, physical storage systems, etc. Every function of critical banking services relies on these, widely acknowledged, exceptionally complex systems to the point they no longer serves banks, but hides them, and at a high financial cost. Due to this over-complexity, banks do not know their own operations and customers accurately, and going digital, as many are trying, cannot be done without high costs and disruption (Wilson, 2013).

Fintech companies, on the other hand, need what banks already have, clients. Partnering with banks would give them instant access to millions of clients that would start using their services. We recently saw the first Fintech startup buying a bank. LendingClub bought Radius Bank in February 2020. The purpose of the acquisition is to enhance the ability to serve its members and growing its market opportunity while increasing and diversifying earnings. Also, having the back covered with a banking institution provides resilience and regulatory clarity attracting new customers that could be distrustful at first.

The 2020 MIT Fintech Conference that took place in Boston the past March 6 gave great insight into the current situation of the industry and how the market will look like in the next few years. The speakers were the best professionals in the Fintech industry, including Scott Sanborn, CEO of LendingClub, Shakib Noori CEO of M-Paisa, Michael Tannenbaum CFO of Brex, Steve Le Roux Founder & CEO of Envel, Steve Fredette President & Co-Founder of Toast, etc. and Kevin Walsh, Vice President of Radius Bank, that as seen above has been recently acquired by LendingClub.

The conclusion they all agreed on was that for Fintech startups to be successful, they need to both collaborate and compete with banks. While they have to challenge the way banks operate, it is essential and necessary for fintech to partner with them.

In a partnership, both would be benefited from the technology and great need of clients, and additionally, those strategic partnerships allow banks to attain their internal goals more effectively. Wells Fargo, for example, in May 2019, led Openfin's \$17M Series C. Now, the bank leverages the platform internally to help modernize its software for front-and back-office functions (CBInsight, 2019).

According to Denise Leonhard, Head of Global Credit Expansion, Business Development, and Strategy at Paypal,

“[Nobody] is going to be able to do it alone. To get to the next evolution of payments, it's going to be really partnership driven. Established firms offer fintech a level of scale they wouldn't be able to access otherwise. [Fintechs] may have a great unique solution, but they can't actually scale, and you need scale to drive forward.”

Meanwhile, Kate Adamson, the head of Mortgage for Plaid, said that “There is a lot we can gain from partnering with financial institutions.... Banks have scale, they have brand alignment”.

5. CONCLUSION

During the length of this essay, the two current challenges in a globalized world were covered. At the beginning of the study, we talked about Blockchain and its characteristics, understanding in depth the traits that make this innovative technology unique and highly valuable for projects that could have an impact on both social enterprises and the banking industry.

Then, after sharpening our understanding of the ways banks make money, we analyzed the income statements of a national and a multinational bank, Bankia, and Bank of America. We noticed how most of their income turns out to be from interests and commissions. Besides, we could appreciate how Bankia has had a negative income growth rate and a positive expense growth rate from 2018 to 2019, whereas Bank of America had a Net Income negative growth rate of -2,55% in those two same years. Once having a better outlook, we exposed how the Fintech industry could harm banks' income due to the intuitive product design, accessibility, and faster services providing similar services than banks, most of the time cheaper. However, the Fintech industry is not the only threat; the Bigtech industry is growing and is already having an impact on banks. Back to Bank of America, even though trends are showing that the Fintech sector is gaining weight, it is too soon to state a consistent correlation between a negative growth rate of Bank of America from 2018 to 2019 and the growth of the Fintech industry. The impact of this new industry cannot be quantitatively measured yet, but it can be affirmed that it has an exponential growth, and every year the impact may be incrementing.

In 2020, with a global picture significantly changed due to COVID-19, and with many countries experiencing a complete lockdown, consumers have seen the importance of digital banking, and the need to go physically to a bank branch has lost value. This new global picture may positively affect the scalability of Fintech startups and Bigtech companies' services, and banks, realizing the importance of the digital trend may want to invest heavily in the Fintech industry to reduce their infrastructures.

The second part of the project focused on how new technologies support sustainable growth in the long term; we studied the positive impact it has on efficiency and productivity in the workplace, and the new tools marketers are using to reach bigger target audiences while increasing customization to attain companies growth and countries prosperity. Later on, knowing the importance of the 2030 Sustainable Development Goals for the world, we studied how new technologies and tech startups can effectively impact most of the goals helping us

obtain better and faster results. To show the enormous effect a Fintech startup can have in the lives of millions of people, we studied in depth the case of M-Pesa, displaying the possibilities it gives to developing countries, and the impact it has on reducing inequalities.

Finally, we saw that Bigtech and Fintech companies have arrived in the banking industry intending to stay and how the best solution for them is partnering with financial institutions. Bigtech companies do not want to be regulated as banks, and a partnership with them would give clients a better sense of security using their services. Meanwhile, through partnerships with financial institutions, Fintech startups' scalability and reliability would be highly benefited. Banks, on the contrary, need to reduce their infrastructures to gain efficiency, and the Fintech industry can be the solution for them.

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