Maja Pejkovska

Potential negative effects of Fintech on the financial services sector

Examples from the European Union, India and the United States of America

Helsinki Metropolia University of Applied Sciences

Bachelor of Business Administration

Double Degree in European Business Administration

Thesis

24.04.2018

Helsinki Metropolia University of Applied Sciences

Author(s) Title Number of Pages Date	Maja Pejkovska Potential negative effects of Fintech on the financial services sector. Examples from the European Union, India and the United States of America 56 pages + 0 appendices 24 April 2018
Degree	Bachelor of Business Administration
Degree Programme	Double degree in European Business Administration
Specialisation option	Finance and Accounting
Instructor(s)	Kevin McIntire, Senior Lecturer and Thesis Supervisor

This paper examines the potential negative effects of Fintech on the global financial services sector. Due to the broad scope of Fintech the paper focuses only on three elements i.e. blockchain & cryptocurrencies, alternative payment methods and investment & banking and uses arguments and empirical evidence that refer to three geographic and political regions i.e. the EU, India and the USA, in order to analyze the influence of Fintech companies on traditional financial services providers, the reasons behind Fintech's quick development and expansion along with details on the current status of Fintech regulation in the EU, USA and India. The analysis shows that current regulation of Fintech in the aforementioned regions is inappropriate and could lead to potential negative effects on the global financial services sector such as corruption of cybersecurity, infringement of data privacy and utilization of Fintech services for illegal purposes. Therefore, authorities in the EU, India and the USA need to focus on creating suitable regulations for Fintech in order to mitigate potential negative effects.

Keywords	Fintech, financial services, digitalization, blockchain, cryptocurrency, payment, investment, banking, regulation, negative effects, financial intermediaries, data privacy, cybersecurity

Contents

List of tables and figures

1 Introduction

The aim of this thesis is to explore the topic regarding the potential negative effects of Fintech elements such as blockchain & cryptocurrencies, alternative payment methods and investment & banking on the global financial services sector exemplified through the experiences of the EU, India and the USA. This topic is significant and relevant due to the fact that the financial system and services influence many important aspects of people's daily lives and are used to complete even the smallest of transactions.

Majority of the reviewed literature, academic journals and consulting reports appear to focus mainly on the positive characteristics and benefits of Fintech and rarely speak of its potential negative effects. Therefore, I decided to research this topic and determine the possible negative effects of Fintech's blockchain & cryptocurrencies, alternative payment methods and investment & banking elements on the global financial services sector by focusing on examples from the EU, India and the USA.

For that purpose, I start with summarizing the reasons why both themes are a vital part of my research, i.e. why are they important and relevant to people in the EU, USA and India nowadays. Afterwards, the paper continues with an explanation of the terms 'Financial intermediaries' and 'Fintech' (elements: blockchain & cryptocurrencies; alternative payment methods and investment & banking) and then continues with examining how Fintech start-ups, which contain the aforementioned elements influence the incumbents in the financial services sector. In addition, the reasons behind the fast development and expansion of these Fintech elements are addressed. Afterwards, the paper proceeds with showing empirical evidence of the growing importance of the Fintech elements mentioned above. The literature review is then finalized by identifying the potential negative effects of Fintech and the reason for their existence.

The literature review is followed by the description of the analytical framework and methodology used for collection and analysis of the relevant information and data presented in the literature review and utilized in an attempt to answer the research question 'Could lack of proper regulation of Fintech lead to potential negative effects on the global financial services sector?' After introducing the analytical framework and methodology that serve the purpose of showing that despite of the benefits it brings, Fintech has

potential negative effects on the global financial services sector, I present the findings that are relevant for answering the research question mentioned above.

Afterwards, the thesis continues with a discussion and analysis of the research findings including the reasons for the expansion of Fintech, the current status of the addressed elements of Fintech in the EU, USA and India and the potential negative effects of Fintech. Finally, the paper ends with a conclusion regarding the potential negative effects of Fintech on the global financial services sector, potential prevention methods for those effects and recommendations for further research considering the limitations and constraints of my own research.

2 Literature review

2.1 Relevance of the research topic and question

A strong financial system is one of the main pillars of a developed and stable society (de Haan et al. 2015: 5). Without a fully-functional financial system it would be very difficult for investors and savers to find one another and exchange funds safely (de Haan et al. 2015: 6). Financial intermediaries are important for the modern societies worldwide because they are components of the financial system and provide financial services, which affect every area of people's lives.

The economist John Kay (2010: 7-8), explores the utilitarian aspect of financial services and states that they are far too important for the contemporary society. This statement is supported by the fact that majority of legal business transactions need to first pass through a financial intermediary before reaching their destination in order to mitigate the risk of asymmetric information and moral hazard (Krugman 2009: 154-160; Pouryousefi & Frooman 2017: 163-182). Therefore, in the past three decades using financial services provided by traditional institutions has become a necessity rather than a choice.

However, in the last few years technology has been developing at a rapid pace and has also found its way into the financial services sector. It even managed to establish a separate segment known as Financial technology or Fintech and influence the way in

which business is conducted in the global financial services sector. Thus, the potential negative effects Fintech may have on the sector are relevant and worthy of research.

Given the fact that the global financial services sector is a very broad concept, for the purpose of this research I simplified it to only include examples from the EU, the USA and India. In order to facilitate the understanding of this research I use the next two subsections of chapter 2 to define the meaning of the terms 'Financial intermediaries' and 'Fintech' in relation to this research.

2.2 Defining 'Financial intermediaries'

Financial intermediaries are generally defined as private companies or public institutions, whose main function is to provide financial services to natural and legal persons (Rosen 2013: 625). The financial services provided by such organisations can be basic such as the possibility for depositing and saving money or more complex such as lending, investing, borrowing money and offering financial advisory and asset/wealth management services (ECB 2017). However, the most important functionality of financial intermediaries is the handling of financial transactions on behalf of their clients i.e. facilitating the process of conducting and/or receiving payments (Rosen 2013: 625-628). Through the aforementioned functions and processes, financial intermediaries create liquidity, which has a positive influence on the development of the economy (Mohammad 2014: 2-3).

2.3 Defining 'Fintech'

In the past decade, Fintech managed to establish itself as a separate segment within the financial services sector. The main players in this segment are companies (usually start-ups), that render financial services similar or identical to the ones rendered by traditional financial intermediaries. However, unlike the traditional financial services providers, companies within the Fintech segment relay almost exclusively on employing state-of-the-art technology and internet-based software, in order to fulfil their clients' needs (PwC 2016: 3).

Nonetheless, the Fintech segment includes many elements, which according to Dortfleitner et al. (2017: 34-36) can be *"loosely"* categorized into four main segments i.e. *"financing"*, *"asset management"*, "*payments"* and "other Fintechs". The four main segments along with their elements are visible in figure 1, below.

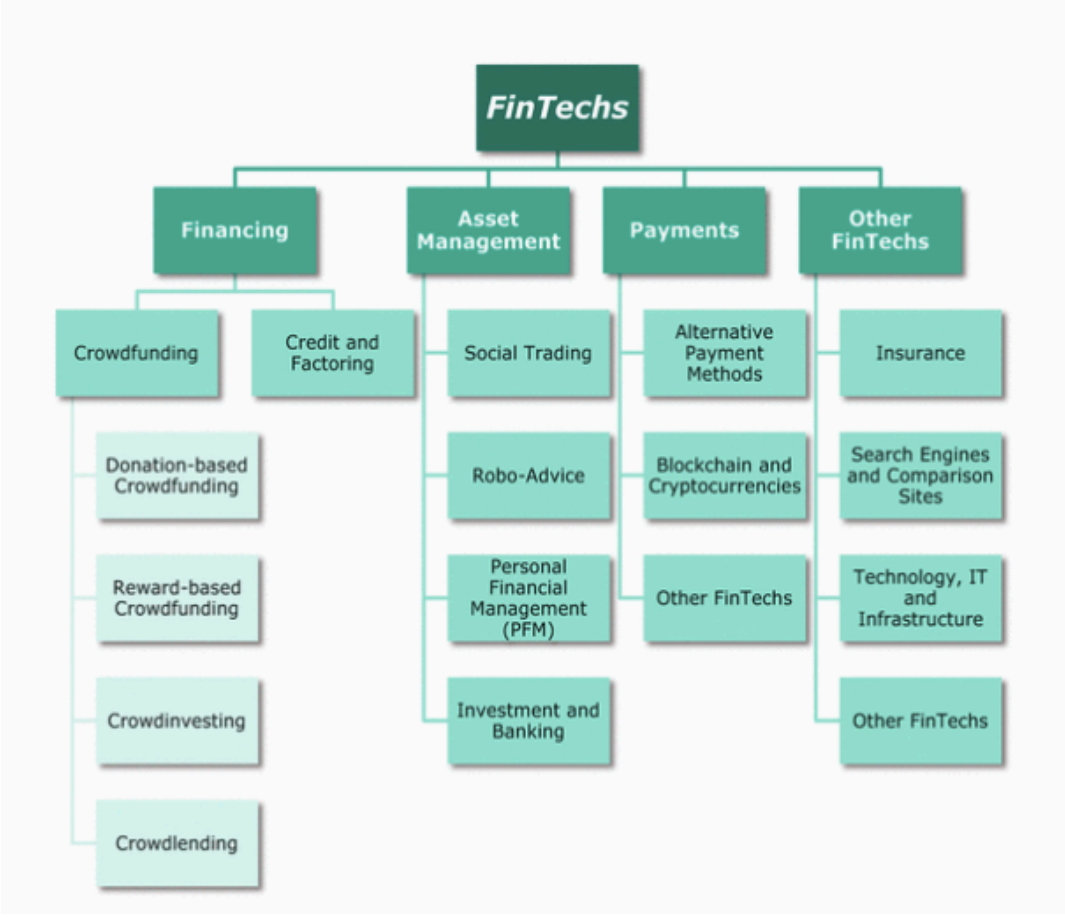

Figure 1. Segments and elements of Fintech (Dortfleitner et al. 2017: 37).

Due to the complexity of both the financial services sector and Fintech as a segment and due to the limited research resources, this thesis only focuses on the following three elements of Fintech: blockchain & cryptocurrencies, alternative payment methods and investment & banking. The reasons why I limit the research to only three Fintech elements is the complexity of the topic and the fact that most relevant information and data regarding Fintech is available for the aforementioned elements. In order to provide a better insight into all of the Fintech elements included in the research and help determine the possible negative effects of Fintech, explanations for those elements will be provided in the next three sub-subsections of this thesis.

2.3.1 'Blockchain and Cryptocurrencies' as an element of Fintech

Cryptocurrencies can be used as means of payment just as regular money issued by central banks is and it can be also saved and exchanged (Dortfleitner et al. 2017: 45-47). All of this is possible without the use of financial intermediaries as a result of a highly developed technology called blockchain (Dortfleitner et al. 2017: 45-47). In her article, *"Blockchain technology and decentralized governance: Is the state still necessary?"*, Atzori (2017: 45-46) gives the following definition with regards to blockchain technology:

> *"In overly concise terms, we can define the blockchain as a database that contains all the transactions ever executed in a peer-to-peer network. It consists of a permanent, distributed digital ledger, resistant to tampering and carried out collectively by all the nodes of the system. The formidable innovation introduced by this technology is that the network is open and participants do not need to know or trust each other to interact: the electronic transactions can be automatically verified and recorded by the nodes of the network through cryptographic algorithms, without human intervention, central authority, point of control or third party (e.g. governments, banks, financial institutions or other organizations). Even if some nodes are unreliable, dishonest or malicious, the network is able to correctly verify the transactions and protect the ledger from tampering through a mathematical mechanism called proof-of-work, which makes human intervention or controlling authority unnecessary.* "
>
> (Atzori 2017: 45-46).

Based on the aforementioned definition, it can be determined that the main purpose of blockchain technology is to completely eliminate the need for an intermediary in favour of a "*decentralized peer-to-peer network*" (Atzori 2017: 46). Currently, blockchain is used mainly for the creation and maintenance of cryptocurrencies such as the globally known Bitcoin, which has shaken up the financial markets, especially in the past few

months. Cryptocurrencies like Bitcoin allow people to conduct and receive payments online without the interference of a third party and unlike currencies issued by states' central banks that have a physical format, cryptocurrencies exist only in digital format (Sahoo 2017: 54).

In addition, the supply of fiat currencies is controlled by the government, whereas cryptocurrencies have a fixed number of *"currency units"* (Sontakke & Ghaisas 2017: 12-13). Due to the limited supply, cryptocurrencies are considered to be scarce assets and this trait increases their value on the financial markets (Sontakke & Ghaisas 2017: 12-13). Nonetheless, blockchain technology can be utilized for many other purposes, which go beyond the general public's understanding due to the exponential development of the aforementioned technology and people's inability to fully comprehend it (Pasztor 2018: 32).

2.3.2 'Alternative payment methods' as an element of Fintech

Alternative payment methods generally refer to mobile and online payment solutions that are provided by Fintech companies (Dortfleitner et al. 2017: 46). In order to be able to utilize such solutions, people need to possess a smartphone or a computer and have access to the internet. The users of these solutions can make money transfers and payments quickly, seamlessly and at an acceptable price (Dortfleitner et al. 2017: 46-47). The transactions are usually peer-to-peer and they are conducted in real-time (Dortfleitner et al. 2017: 46-47). This attribute gives Fintech companies a competitive edge over traditional financial intermediaries. In addition, the emergence of the aforementioned alternative and seamless payment solutions is affecting the behaviour of consumers, which start to prefer digital channels when dealing with money transactions instead of visiting the *'physical locations'* of financial intermediaries (Canaday 2017: 16-17).

As a result of the fast development of technology, traditional financial services providers are under pressure to make changes in their corporate strategies and invest more capital into the development of both their IT and Human resources in order to be able to remain competitive in the payments business (Canaday 2017: 17). Nonetheless, Fintech companies would also need to enhance their services, so that they are able to better satisfy consumers' needs (Canaday 2017: 17).

2.3.3 'Investment and banking' as an element of Fintech

Almost every individual in the contemporary world is familiar with the concepts of investment and banking. However, with the quick development and expansion of technology, the traditional investment and banking business is undergoing changes as new Fintech companies are emerging, entering the market and increasing the competiveness of the sector (Vasiljeva & Lukanova 2016: 25). For the purpose of this research investment & banking services exclude payment methods and focus on financial advisory, asset and wealth management services, because alternative payment methods are treated as a separate element in sub-subsection 2.3.2.

Namely, some Fintech companies are able to offer advisory and asset management services at a cheaper rate than traditional banks and investment firms due to the partial or complete automatization of their operations (Dortfleitner et al. 2017: 43). Whilst some experts in the financial sector claim that Fintech companies make the investment and banking business more transparent, accessible and customized (Dortfleitner et al. 2017: 46-47), others counter this claim by stating that Fintech companies are failing to comply with regulations and discourage the general public from using the services provided by Fintech companies (Vasiljeva & Lukanova 2016: 32).

Nonetheless, the investment and banking services provided by Fintech companies seem to appeal to the general public and especially to *'Millennials',* who prefer to handle their finances online rather than face-to-face (Thompson, 2017: 7). In her journal, Thompson (2017: 8-9) refers to online services offered by non-traditional financial intermediaries i.e. Fintech firms and there is no mention of online services offered by traditional banks. Despite the noticeable shift in consumers' preference, there are still many people that are more comfortable with handling their finances face-to-face rather than via digital channels (Konigsheim, Lukas & Noth, 2017: 345-350).

Whilst section 2.3 dealt with the general definition of Fintech and explanations regarding its elements, section 2.4 discusses the influence that Fintech has on the traditional financial intermediaries.

2.4 Influence of the Fintech start-ups on the traditional financial intermediaries

Fintech companies have yet to establish themselves as an influential force in the financial services sector (Nicoletti 2017: 5-6). According to Gomber et. al (2018: 226-227), the segment has started to attract sizeable investments, which are expected to increase in the future as more technology is deployed in the financial services operations.

The potential of Fintech can be seen in Figure 2, which demonstrates that the amount of funds invested in Fintech companies has been growing exponentially in the past few years on a global level. The figure also shows the volume of Fintech investment deals that have been concluded in the period between 2010 and 2017.

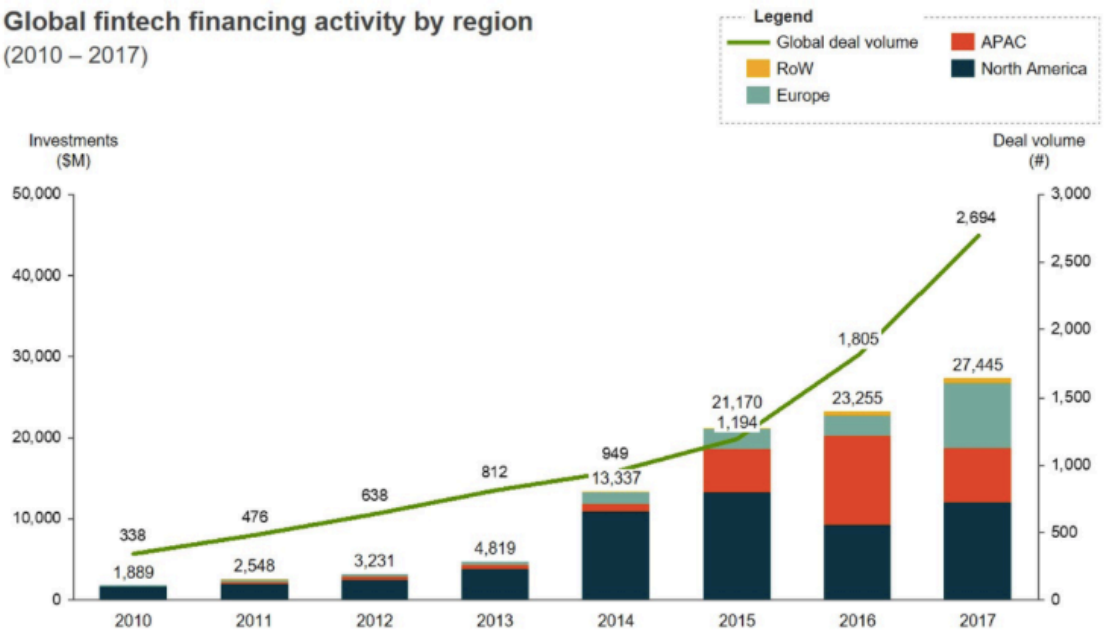

Figure 2. Global Fintech Financing Activity 2010-2017 (Accenture 2018: 1).

The data provided in Figure 2, shows that Fintech is a segment of the financial services sector that is still in its infant stage and far more investment is required if Fintech start-ups are to compete with traditional, cash rich and politically influential financial services providers (Bugrov et al. 2017: 2-3). Despite this, the global traditional financial services providers need to pay attention to the development of Fintech and try to update and improve their strategies and services and protect themselves from losing market share to Fintech companies (Bugrov et al. 2017: 2-3). Additional evidence for the potential of

Fintech is the general public's increased investment in blockchain and cryptocurrencies through Initial Coin Offerings (ICOs). In their article *"Switzerland: Initial coin offerings"* ,Reutter and Flühmann (2017:1) give the following definition about ICOs:

"ICOs are a digitalised method of raising capital in which an organisation issues tradable digital units (tokens) to finance a specific project or to develop it further. They are exclusively used to fund early stage projects of startups, often without a clear track record and with unclear success probability. In the course of the offering, the investor receives a token from the issuing organisation in exchange for cryptocurrencies (for example, bitcoin) or standard currencies (also referred to as fiat money)."

(Reutter & Flühmann, 2017: 1)

For the purpose of this research, the focus is mainly put in ICOs, which are centered around blockchain and cryptocurrencies. Figure 3, below displays the number of ICO projects for 2017, based on the region of the legal entity and the region of the entity's CEO or Founder (Atomico 2017: 10).

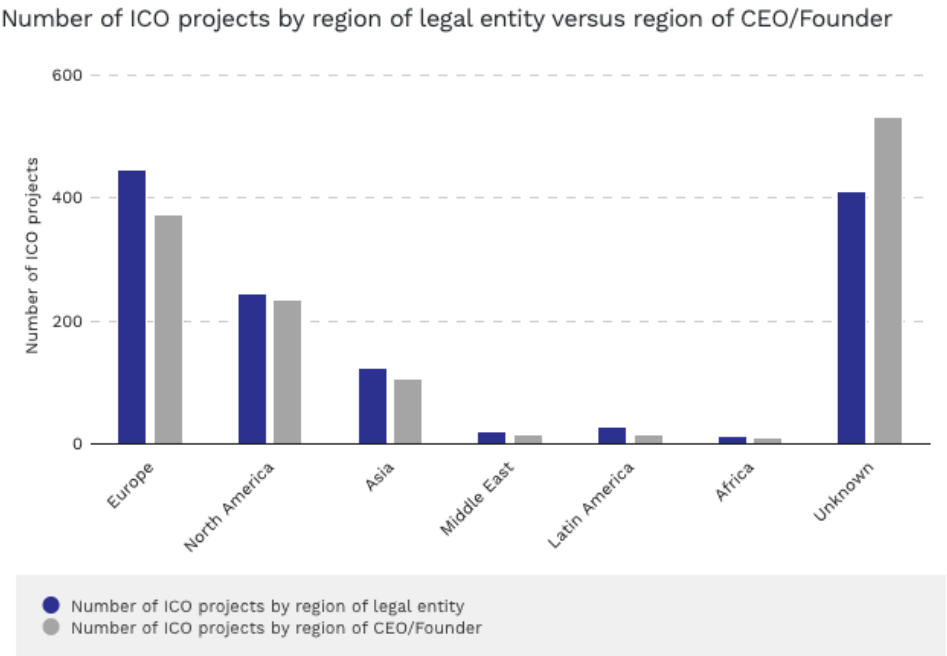

Figure 3. Number of ICOs by region of legal entity and region of CEO or Founder (Atomico 2017: 10).

Disregarding the unknown category, leaves Europe as the leading region both in number of ICO projects by region of legal entity and in number of ICO projects by region of CEO

or Founder (Atomico 2017: 11). North America and Asia lag behind on the second and third place. Another interesting fact is that 40 percent of all ICOs in the region of Europe are actually based in the countries of the EU (Atomico 2017: 11). This shows that the population of the EU is open and willing to invest in the development of Fintech and especially of blockchain technology and cryptocurrencies.

According to Deloitte's (2017: 3) research, the number of newly founded Fintech companies worldwide has been increasing exponentially in the period between 2008 and 2014. Nonetheless, the number of Fintech companies founded per year has decreased in the period between 2015 and the first quarter of 2017 (Deloitte 2017: 3). The aforementioned data is visible in Figure 4, below.

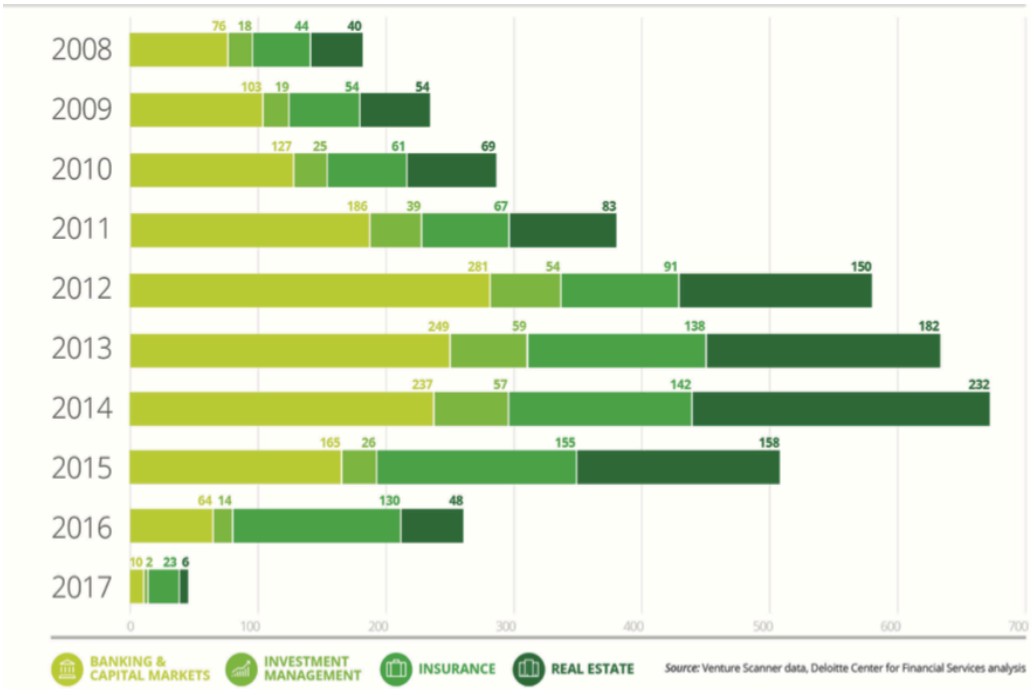

Figure 4. Number of Fintech companies founded per year 2008-2017 on a global level, categorized by segments (Deloitte, 2017: 3-4).

The data presented above shows that highest number of Fintech companies founded, were categorized in the banking and capital markets segment, which includes the payments element.

Based on these numbers it appears that consumers are responding to the changes in the financial services' ecosystem and may try to bypass traditional financial intermediaries in favour of Fintech start-ups when payments are in question (Deloitte 2017: 3-4). Figures 2 to 4 above show only a small part of the potential of Fintech companies involved with the elements that are being examined in this thesis (blockchain & cryptocurrencies, payments and investment & banking).

In his book, *"Breaking Banks: The Innovators, Rogues and Strategists rebooting Banking"* (2014: 240-250), King states that Fintech disruptors' *modi operandi* include deep analysis of the traditional intermediaries' processes, operations and strategies worldwide and attempts to develop services which are *"a complete opposite"* to the ones provided by the traditional financial intermediaries with the additional benefit of an affordable price (King 2014: 240-250).

These types of actions could influence banks and other traditional financial services institutions by either undermining their profitability or providing a common ground for building collaborative partnerships, which would help the capital-rich traditional financial intermediaries gain access to the best technology and state-of-the-art software, whereas the small Fintech start-ups would get the capital needed for investing in new projects and developing better services for the consumers worldwide (Bugrov et al. 2017: 2-3). Additionally, around 80 percent of traditional financial intermediaries worldwide believe that development and expansion of Fintech is putting the profitability of their business at risk (PwC 2017: 5).

Despite the fact that Fintech is still a young segment it already started influencing the traditional incumbents. However, in order to better comprehend why Fintech started having influence on the global financial sector, the reasons for its development and expansion need to be known. Therefore, the next subsection of this thesis paper examines those reasons.

2.5 Reasons behind the quick development and expansion of Fintech

The rationale behind the emergence and development of Fintech is a result of multiple trends such as decline of populations' trust in the financial system, change in consumer behaviour that comes with change in generations and level of digitalization (Nicoletti 2017: 4). In order to better comprehend Fintech's existence and the impact it has on the global financial sector it is important to also to know the reasons why Fintech appeared in the first place. To better explain the reasons a comparison is drawn between the aforementioned trends in the EU, USA and India. Other political entities are not considered due to time and resources constraints.

Firstly, the populations' trust in the financial system is explored since financial systems are based on the population's trust in them (de Haan et al. 2015: 7-10). This is also the case with the financial system established by the EU, whose member countries were first crippled by the financial crisis of 2008 and the Great recession that followed afterwards (de Haan et al. 2015: 54-60). Due to the fact that too many European banks were both indirectly and directly involved in causing the crisis, EU citizens' trust in the financial system and intermediaries declined dramatically (Petrakis et al. 2013: 274). Evidence for the growing mistrust of EU citizens in the financial system can be seen in Figure 5 on the following page, which displays the results of the Eurobarometer from 2017 (ECB 2017).

The EU is taken as an example in this research due to its political and economic significance on a global level and due to the fact that along with the USA was one of the geographic and political regions that were affected the most by the crisis of 2008 and the re-cession that followed afterwards. Similar to India, it consists of 27 member countries, which have ethnic, religious, linguistic and economic differences (Azam & Bhatia 2017: 205-207).

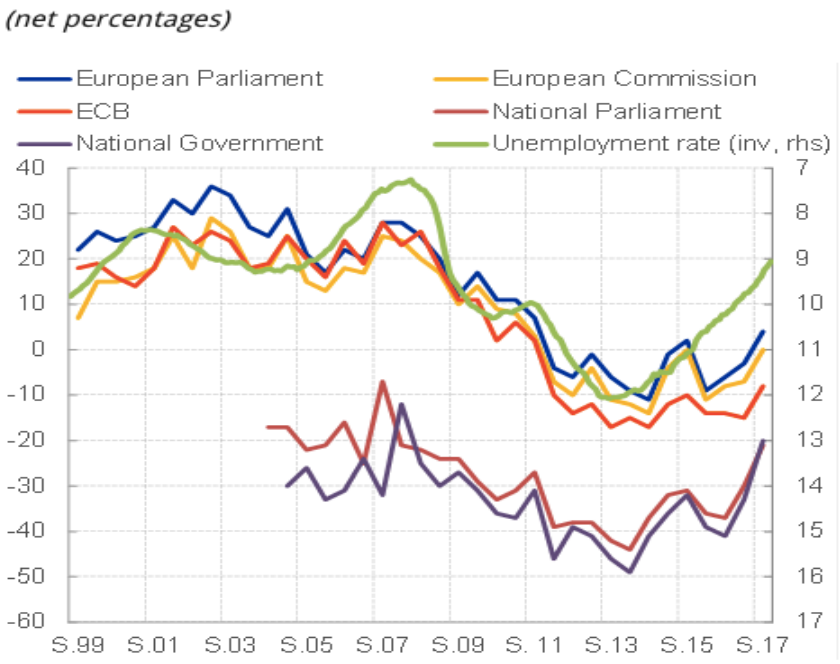

Figure 5. Level of EU citizens' trust in the ECB (ECB 2017).

Figure 5 represents the net trust that EU citizens have in the institutions, including the European Central Bank (ECB 2017). The results have been calculated by determining the difference between the percentage of survey respondents that trust the institutions and the percentage of respondents, that mistrust the institutions (ECB 2017). The results shown in the figure are defeating, because the Eurobarometer recorded them after the EU and the ECB decided to implement tighter regulations regarding the operations of financial institutions, in order to increase the transparency and protect both savers and investors from losing even more assets in another potential crisis (ECB 2017).

A similar trend seems to appear in the USA according to Gallup's latest poll from May 2013. The reason why the USA is taken as an example in the research is because it has the most sophisticated and complex financial system and like the EU it has an enormous political and economic significance on a global level and it was one of the geographic and political regions that were affected the most by the crisis of 2008 and the re-cession that followed afterwards. The USA is also similar to India as both entities represent federations consisting of many states which have economic differences (Azam & Bhatia 2017: 205-207).

Only a third of the US citizens that took part in the poll believe that the Federal reserve, the country's central bank *"is doing a good or excellent job"* (BBC News 2015). The results of the poll can be seen in Figure 6.

How would you rate the job being done by ... ? Would you say it is doing an excellent, good, only fair, or poor job?

Ranked by net positive rating

	% Excellent/ Good	% Only fair	% Poor	Net positive (% Excellent/Good minus % Poor)
The Centers for Disease Control and Prevention, or the CDC	60	27	8	52
The Federal Bureau of Investigation, or the FBI	55	27	12	43
NASA -- the U.S. space agency	42	32	10	32
The Central Intelligence Agency, or the CIA	40	35	13	27
The Food and Drug Administration, or FDA	45	32	21	24
The Department of Homeland Security	46	28	23	23
The Environmental Protection Agency, or EPA	41	33	21	20
The Federal Reserve Board	33	34	21	12
The Internal Revenue Service, or the IRS	27	29	42	-15

May 20-21, 2013

GALLUP

Figure 6. Level of US citizens' trust in the Fed (Gallup 2013).

The results shown in Figure 6 appear to be a consequence of the subprime mortgage crisis that hit the USA in 2008 and was to a greater extent, caused by *"too big to fail"* financial institutions such as Merrill Lynch, Citigroup, AIG, Goldman Sachs etc. (de Haan et al. 2015: 61). All of these institutions took very large and uncalculated risks (de Haan et al. 2015: 54-60). Their large appetite for high returns on their investments appears to have clouded their judgement and whilst trying to satisfy it, they failed to account for the risk associated with those high returns (Stan and McIntyre 2012: 19-20).

Due to their risk mismanagement, these financial institutions incurred astounding losses and they were obliged to seek assistance from the US government, which at the end had to bail them out using the money of US taxpayers, because it recognized that these financial companies were simply too important for the economy and hence needed to be saved (Pajarskas & Jociene, 2014: 85-90).

The emerging economies (EMEs) of Asia were also affected by the global economic crisis of 2008 (Glick & Spiegel 2009: 10-15). However, their exposure was not as big as the one of the USA and the Eurozone, because they had entered the crisis with better *"fiscal and external debt positions, foreign exchange reserves and more resilient banking sectors*" (Glick & Spiegel 2009: 12).

Whilst, the USA and the Eurozone tackled challenges such as the subprime mortgage and the sovereign debt crises, the Asian EMEs did not have such problems (Glick & Spiegel 2009: 12). Nonetheless, due to increased globalization and interconnectedness between all three regions, they faced sharp declines in the capital markets, credit availability and international trade, which later resulted in a slow-down of their economic growth (Glick & Spiegel 2009: 12).

For the purpose of this research the credibility and work of the Reserve Bank of India (RBI) will be examined. Due to time and resources constraints, it was not possible to include more than one country from Asia in this research. However, India is a suitable Asian representative as it exemplifies both vast potential in terms of human and natural resources and underdevelopment from a socioeconomic aspect (Rao 2017: 55-56). In addition, it has similarities with both the USA and the EU, because it is a federation that consists of various states, which have ethnic, religious, linguistic and economic differences (Azam & Bhatia 2017: 205-207).

Despite the difficult circumstances, India was able to recover quickly and endure the global economic crisis of 2008, better than most other countries worldwide as a result of its conservative *"banking rules and regulation framework"* (Goyal & Joshi 2012: 19-22). On account of this policy the banking sector in India is regarded as mature and the balance sheets of the banks are *"clean, strong and transparent"* (Goyal & Joshi 2012: 19-22). Therefore, the citizens of India did not lose confidence in their financial system and the credibility of the RBI did not decline (Glick & Spiegel 2009: 10-15).

Although no direct statistics are available regarding Indian citizens' trust in the RBI, indirect data shows that at the beginning of the 2010s the banking sector in India faced a surge in frauds, which appears to indicate a loosened regulation of the financial services sector in terms of security and data privacy (Kaveri 2014: 15-17).

The increase in fraudulent cases related to the financial services sector is visible in Figure 7, situated below.

Year	<Rs 1 lakh		>Rs.1 lakh and upto Rs.1 crore		Rs.1 crore - Rs 50 crores		>Rs 50 crores		Total Fraud Cases	
	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount(Rs.. in crores)
Pre-2004	2292	4.24	819	96.65	613	2951.64	13	1244.28	3737	4296.80
2004-05	7553	12.50	2407	287.32	111	584.89	1	53.57	10072	938.29
2005-06	11395	18.63	2334	290.20	192	1009.23	2	135.47	13923	1453.53
2006-07	20415	31.22	3048	325.02	158	791.17	1	78.45	23622	1225.86
2007-08	17691	30.25	3381	383.98	177	662.31	-	-	21249	1076.54
2008-09	19485	33.85	4239	442.94	214	1129.56	3	305.33	23941	1911.68
2009-10	20072	30.38	4494	474.04	222	1129.28	3	404.13	24791	2037.81
2010-11	15284	26.09	4250	494.64	277	1515.15	16	1796.20	19627	3632.08
2011-12	10638	19.05	3751	509.17	327	2113.23	19	1850.08	19827	3832.08
2012-13	9060	25.11	3816	491.13	372	2798.00	45	5334.75	14293	8646.00
Total	133855	228.31	32539	3795.10	2663	14684.46	103	11202.25	169190	29910.12

Figure 7. Number of fraud cases in the financial services sector, including the amount of stolen money calculated in domestic currency i.e. INR (Kaveri 2014: 17).

The figure above shows that in the period before 2004, the number of fraudulent cases in the financial services sector was much smaller (Kaveri 2014: 15-17). Nonetheless, as time passed the amount of frauds increased exponentially and the highest number of recorded fraud cases amounted to 20072 in the period between 2009 and 2010 (Kaveri 2014: 15-17). This data indirectly puts the credibility of the country's financial system into question, due to the fact that regulators were not able to prevent this kind of fraudulent behaviour by improving India's monetary policy and legislation regarding the operation of financial services institutions.

Nonetheless, the crisis and the recession in all three regions i.e. the EU, the USA and India did not only have negative repercussions and effects, but they also brought disruption and innovation in the financial services sector, which catalyzed the development and expansion of Fintech (Zhang et al. 2015: 60-76).

Fintech start-ups, especially those using blockchain technology have provided the agility, freedom and access to faster and more affordable financial services that traditional financial institutions lack, through the clever utilization of the internet and development of high-end software (Skan et al. 2015: 3). Hence, the term "digital revolution" coined by Skan et al. in Accenture's report from 2015 is suitable when discussing the development and expansion of Fintech. This so called "digital revolution" was ignited by the increased level of digitalization (BBVA Research 2017: p.5). The level of digitalization is measured by a digitalization index, which has been calculated on the basis of the following components: *"existing levels of digital infrastructure, costs, regulation, private users' adoption, enterprises' adoption and digital content"* (BBVA Research 2017: 6-9). The digitalization indices for the US, the EU and India, can be seen in Table 2, on the following page.

Table 1. BBVA Digitalization index 2015 (BBVA Research 2017: 9).

Digitalization Index					
1	Luxembourg	1.00	46	Kazakhstan	0.47
2	United Kingdom	0.97	47	South Africa	0.47
3	Hong Kong SAR	0.95	48	Slovakia	0.46
4	United States	0.92	49	Mauritius	0.46
5	Netherlands	0.90	50	Colombia	0.45
6	Japan	0.88	51	Russian Federation	0.45
7	Singapore	0.87	52	Italy	0.44
8	Norway	0.86	53	Azerbaijan	0.44
9	Finland	0.85	54	Poland	0.43
10	Sweden	0.84	55	Romania	0.43
11	Switzerland	0.82	56	Croatia	0.43
12	Iceland	0.82	57	Montenegro	0.42
13	Canada	0.81	58	Kuwait	0.41
14	New Zealand	0.80	59	Mexico	0.41
15	Australia	0.79	60	Greece	0.40
16	Germany	0.78	61	Armenia	0.40
17	Denmark	0.77	62	Georgia	0.40
18	Korea, Rep.	0.76	63	Panama	0.40
19	Estonia	0.76	64	Macedonia FYR	0.39
20	France	0.76	65	China	0.39
21	Austria	0.73	66	Thailand	0.38
22	United Arab Emirates	0.71	67	Morocco	0.38
23	Belgium	0.69	68	Philippines	0.37
24	Ireland	0.68	69	Sri Lanka	0.35
25	Israel	0.68	70	Egypt	0.34
26	Bahrain	0.65	71	Indonesia	0.33
27	Lithuania	0.65	72	Bulgaria	0.33
28	Malta	0.64	73	Moldova	0.33
29	Malaysia	0.63	74	Tunisia	0.33
30	Spain	0.62	75	Argentina	0.33
31	Qatar	0.61	76	Kenya	0.32
32	Saudi Arabia	0.59	77	Peru	0.32
33	Portugal	0.59	78	El Salvador	0.32
34	Chile	0.58	79	Serbia	0.31
35	Latvia	0.55	80	Dominican Rep.	0.31
36	Czech Republic	0.52	81	Vietnam	0.31
37	Oman	0.51	82	Honduras	0.30
38	Turkey	0.50	83	India	0.29
39	Costa Rica	0.49	84	Albania	0.26
40	Jordan	0.49	85	Senegal	0.24
41	Cyprus	0.48	86	Guatemala	0.24
42	Hungary	0.48	87	Ukraine	0.22
43	Uruguay	0.48	88	Botswana	0.21
44	Brazil	0.48	89	Nigeria	0.18
45	Slovenia	0.47	90	Lebanon	0.18

According to Table 1 above, the USA has a digitalization of 0.92. This means that it is close to reaching its full potential in terms of digitalization as defined by the variables of the aforementioned digitalization index. Although Luxembourg is the leading country in the table with a digitalization index of 1.00, the average digitalization index for the EU-27 amounts to 0.62, which means that the level of digitalization varies among different EU member countries (BBVA Research 2017: 6-9).

India, on the other hand is lagging far behind the USA and the EU with a digitalization index of 0.29 and it ranks 83rd on the list (BBVA Research 2017: 6-9). These numbers show that certain countries within the EU and India still have a lot of unused potential when it comes to digitalization of services.

Nonetheless, the global economic crisis and the digital disruption are not the only reason for the quick development and expansion of Fintech. Another factor, which affected the aforementioned process is the change in consumer behaviour that comes with the change of generations. Nowadays, millennials represent 24 percent of the population in all EU member countries and they are considered as more *'frugal'* than their X-generation parents (Suddath 2014: 5). Similarly, US millennials make up 25 percent of the overall US population (US Census Bureau 2015). India, surpasses both the US and the EU as millennials represent approximately 30 percent of the overall population, making India the country with the biggest number of millennials in the world (UN Stats 2017).

The term *'millennials'* may bring a certain confusion, because sometimes it is used to describe people born between 1980-1994, whereas in other cases it is used to describe people born between 1982-2004. However, the sources of this thesis include statistics that is commonly used in the market segmentation of the financial services industry, which classifies people born between 1980-2000 as millennials. After clarifying the parameters for millennials as a demographic group, this part of the research paper will proceed by evaluating whether millennials are really that important for the financial services sector as potential customers.

From the research conducted thus far, some analysts have determined that as customers, millennials *"prioritize access over ownership"* and they appear to value experience over material objects (Suddath 2014: 5). Due to the fact that they belong to a group of digital natives they prefer to handle as many of their purchases online and they look for a bundle of easily accessible services and products at affordable prices (Suddath 2014: 5). In addition, millennials search for similar service or product characteristics in regards with the management of their personal finances (Davies et al. 2016: 5-7).

Other analysts, consider millennials to be *"financial novices",* who *"do not have long term investment plans and are more interested in basic banking like having a checking and savings account"* (Efma & Oracle Financial Services Software Limited 2010: 4).

Efma and Oracle's joint report from 2010, also shows that millennials would rather spend money in the present than save for future endeavours. This statement is contradictory to Suddath's (2014: 5) statement that millennials are more *"frugal"* than their predecessors. Thus, it becomes more complicated to determine whether millennials are more interested in utilizing Fintech start-ups to reduce their financial services' costs or remaining loyal to the traditional financial services' providers, who have significantly more assets and liquidity and are able to provide more credit to satisfy millennials' need for current spending.

However, both Efma & Oracle (2010: 12) and Suddath (2014: 6) agree that millennials as a segment, are more *"demanding and have greater expectations"* than their grandparents and parents in terms of the price and quality of the services/products they purchase. In addition, they are better connected because of growing up with the development of the internet, the social media and the mobile technology (Efma & Oracle Financial Services Software Limited 2010: 12). Therefore, millennials are able to use their knowledge of these three phenomena to influence society and start altering the way business is conducted in the financial services industry.

Nonetheless, it is very important to take into account that the remaining 76 percent of the population in the EU, 75 percent of the population in the USA and 70 percent of the population in India also includes elderly people, who cope harder with utilizing technology as a medium for receiving financial services and children who are not able to open bank accounts without the approval of their legal guardians (Efma & Oracle Financial Services Software Limited 2010: 9). This demonstrates that although millennials are important for the financial services industry and for Fintech, they still only represent one target group for the financial services providers and the rest of the target groups include elderly people who prefer a more personal approach when handling their finances (Efma & Oracle Financial Services Software Limited 2010: 19).

Taking all previous arguments into consideration, it can be concluded that due to the dysfunction of the financial systems, increased level of digitalization and change in consumer behaviour, Fintech companies have gained momentum and managed to establish themselves as a disruptive force that causes changes, which affect the financial services sector and almost all people worldwide. However, in order to provide a solid argumentation regarding the development of Fintech and its influence on the global financial

sector, more empirical evidence is needed. This evidence is provided in the following section of this thesis and it covers the three elements of Fintech that are relevant to this research i.e. blockchain & cryptocurrency, alternative payment methods and investment & banking.

2.6 Empirical evidence for the growing importance of Fintech

In the previous subsection, data referring to the global investments made throughout all elements of Fintech has been shown. However, the research unit of this paper includes the elements of blockchain & cryptocurrencies, alternative payment methods and investment & banking in the geographic and political regions of the EU, the USA and India. Therefore, in this subsection of the paper the potential of blockchain & cryptocurrencies, alternative payment methods and investment & banking in the aforementioned geographic and political regions is presented.

2.6.1 Evidence for the potential of 'Blockchain and Cryptocurrencies' per region

In the literature review it was mentioned that Europe was the continent, which had the highest number of ICOs for 2017, based on the region of the legal entity and the region of the entity's CEO or Founder (Atomico 2017: 15). The results were shown in Figure 4, located in sub-part 2.3 of the literature review. According to the results there were around 446 ICO projects in Europe in 2017 and 40 percent of them i.e. approximately 178 of those projects occurred within the countries of the EU (Atomico 2017: 16).

The investments in Europe made through ICOs amounted to $1755 million of which $702 million were invested in the countries of the EU (Atomico 2017: 16). These investments are shown in Figure 8, on the next page of this thesis.

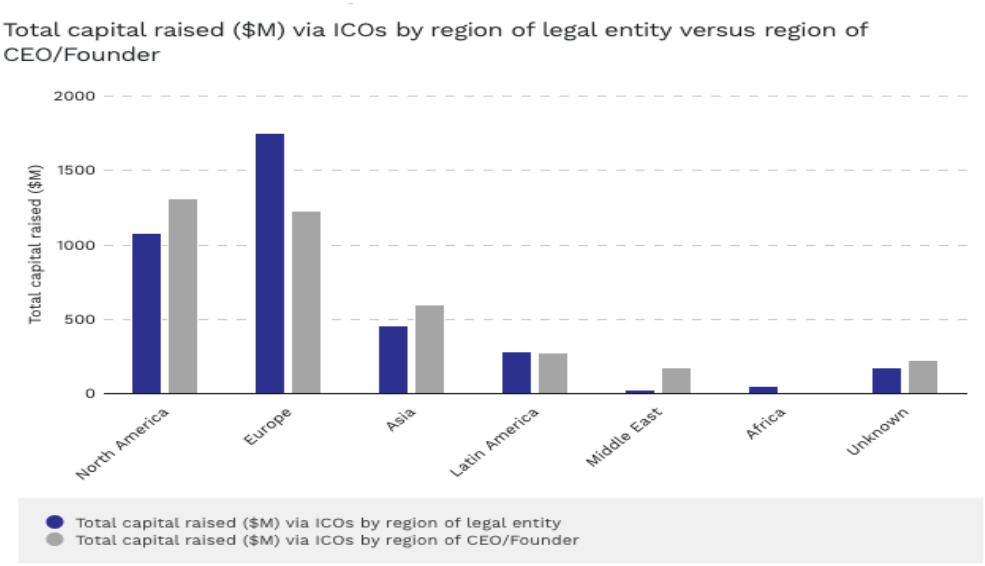

Figure 8. Investment made through ICOs in 2017 (Atomico 2017: 17).

According to Funderbeam's *"Initial Coin Offering report"* (2017: 9-10), on a country-by-country basis, the USA tops the list of ten countries, which had the highest amounts of capital raised through ICOs from 2014 until 2017. The amount of funds raised per country are visible in Figure 9, below.

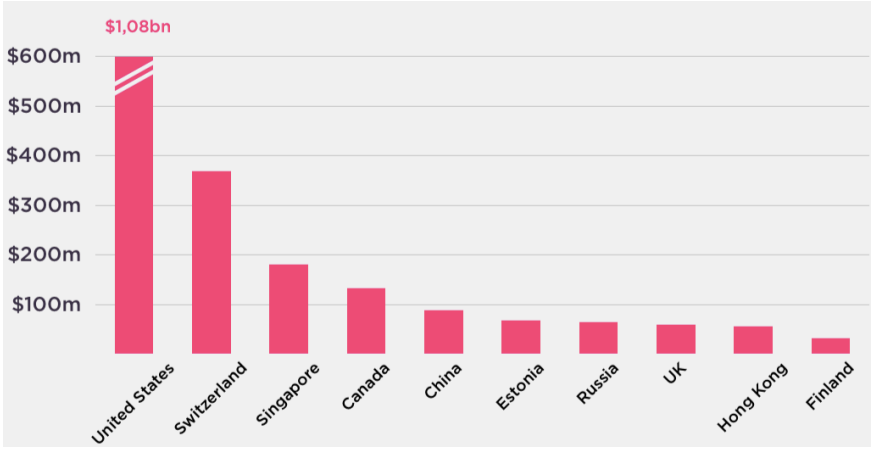

Figure 9. Top ten countries worldwide as per total funds raised through ICOs 2014-2017 (Funderbeam 2017: 9).

The USA flies well above the chart with a sum of $1.08 billion raised via ICOs, whereas all other countries do not pass the threshold of $370 million.

It is noticeable that there are only two current members i.e. Estonia and Finland and one former member country of the EU i.e. the UK in the list, whilst India is not even considered in the list (Funderbeam 2017: 10). Even more interesting is the fact that despite being the country with the highest amount of funds raised through ICOs, only 0.45 percent of the overall start-up funding in the USA was raised through ICOs (Funderbeam 2017: 10). On the other hand, Estonia had 28 percent of the total start-up funding raised through ICOs and that makes the country a leader in these terms (Funderbeam 2017: 10).

Another relevant indicator for the growing importance of blockchain technology and cryptocurrencies is the overall market capitalization of cryptocurrencies worldwide. The data regarding the overall global market capitalization of cryptocurrencies is visible in Figure 10, on the following page of this thesis. The data has been collected and analyzed by one of the most prominent providers on cryptocurrencies' valuations, CoinMarketCap.

Figure 10. Total market capitalization for cryptocurrencies on a global level 2014-2018 (CoinMarketCap 2018: 2).

The figure displays the growth of the cryptocurrencies' market from 28th April 2013 until 7th January 2018. On the first day of the aforementioned time period, the estimated

market capitalization for all cryptocurrencies amounted to approximately $1.6 billion (CoinMarketCap 2018: 2).

Although there was exponential growth between 2013 and 2017, the cryptocurrency market reached the peak on 7th January 2018, when the capitalization equaled $813 billion (CoinMarketCap 2018: 2). Nonetheless, the bubble started to burst already on 21st January 2018 when the market capitalization fell to $453 billion (CoinMarketCap 2018: 2). By 22nd of March 2018, went even further down and was estimated to be $312 billion (CoinMarketCap 2018: 2).

The data in Figures 8 to 10 refers to investments made in blockchain and cryptocurrencies. In addition, it shows that this element of Fintech has enormous potential in the EU and the USA. As far as India is concerned no data was available due to the fact that India banned the usage of cryptocurrencies as a means of payment. However, according to information from Deloitte's report *"Regulatory Sandbox – Making India a Global Fintech Club"* (2017: 14), important corporations have been testing blockchain technology and are willing to start adopting it. Examples of corporations that started pilot projects with blockchain technology is visible in Table 2, below.

Table 2. Pilot projects for blockchain technology usage in India (Deloitte report, 2017: 14)

October 2016	ICICI Bank	• ICICI Bank conducted a pilot project with Dubai's largest bank Emirates NBD to execute international trade finance and remittance transactions using Blockchain
October 2016	Kotak Mahindra Bank	• Kotak Mahindra Bank partnered with JP Morgan Singapore to test block chain trade finance solution on end to end financing
November 2016	Mahindra & Mahindra	• Mahindra & Mahindra tested supply chain finance with help of IBM
January 2017	Yes Bank	• Yes Bank provided Blockchain based vendor financing technology solutions to Bajaj Electricals which reduced cycle of bill discounting from 4-5 days to almost real time
January 2017	Axis Bank	• Axis bank used Ripple's block chain technology to deliver real time international money transfers

According to the examples in the table Indian banks are also interested in the potential offered by the blockchain technology. However, they remain cautious when it comes to experimenting with it.

All the data provided in subsection 2.5.1 refer to the blockchain and cryptocurrencies element of Fintech in the geographic and political regions of the EU, the USA and India. Empirical data regarding the other two elements of Fintech (alternative payment methods and investment & banking) included in this research are presented in sub-subsections 2.5.2 and 2.5.3 respectively.

2.6.2 Evidence for the potential of 'Alternative payment methods' per region

The second element that is explored in this thesis is the 'Alternative payment methods'. This element of Fintech has been one of the first to develop and plenty of Fintech companies and especially start-ups worldwide are involved in the business of providing payment solutions. Evidence for this statement is visible in Figure 11, below.

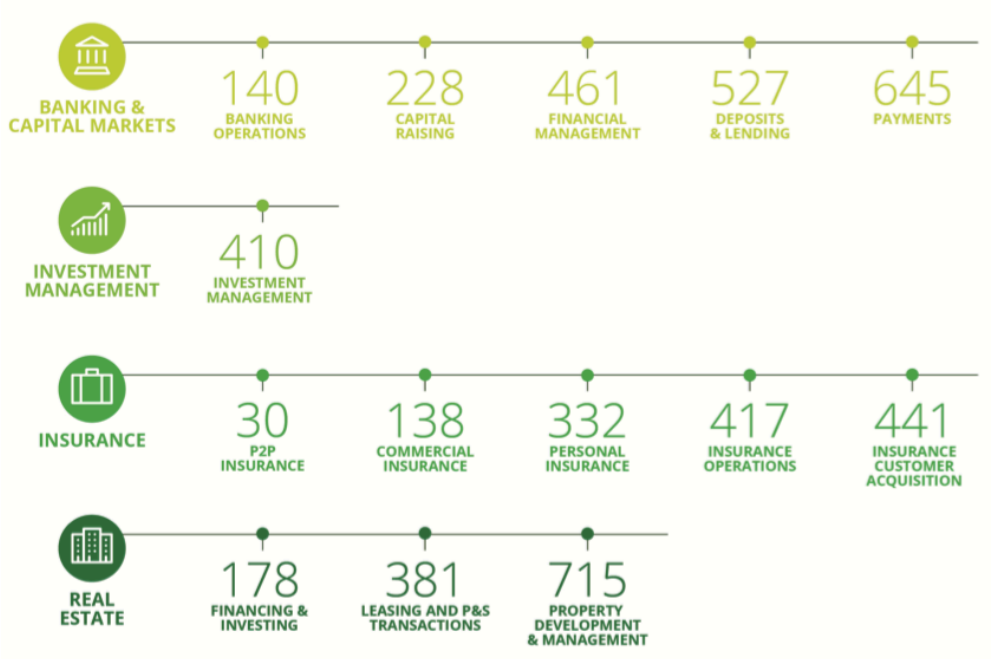

Figure 11. Number of Fintech companies on a global level in 2017, classified by category (Deloitte 2017: 4).

According to the statistics shown in the figure above, the number of Fintech companies providing alternative payments methods in 2017 was 645 (Deloitte 2017: 4-6). The only other sub-segment of Fintech, which surpassed the number of companies involved with payments was the property development & management sub-segment with 715 companies involved in it (Deloitte 2017: 4-6).

Alternative payment methods seem to be one of the most prominent Fintech elements ents in the EU according to the research made by the European Banking Authority (EBA) in 2017. The research concluded that there are more than 1500 Fintech companies operating within the EU and they created a sample of 282 companies (for which they had relevant data and information) in order to classify them by their regulatory status (EBA, 2017: 16-22). From that sample of 282 Fintech companies, which were taken into consideration for the research approximately 18 percent or 50 companies declared themselves as *'payment institutions'* liable under the Payment Services Directive (PSD), (EBA, 2017: 21-22). The data is visually presented in Figure 12 below, where the firms from the sample are classified according to their regulatory status.

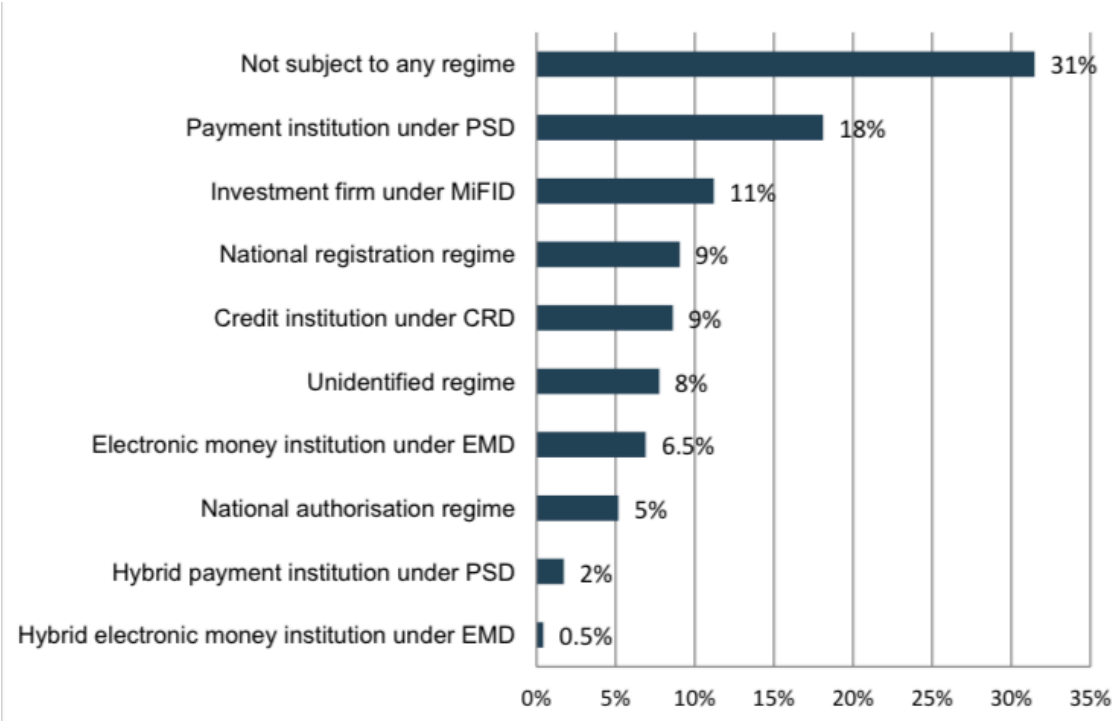

Figure 12. Fintech companies in the EU, classified by regulatory status (EBA 2017: 21).

Another interesting aspect presented in the figure above is the fact that approximately 31 percent of the whole sample i.e. 87 companies are not liable to any kind of regulation (EBA 2017: 21). This number is high, especially if it is considered that there are more than 1500 Fintech companies with operations in the EU and the sample consists of only 282 companies (EBA 2017: 16).

In terms of non-cash payments, the US is the world leader with 402 transactions per capita and a compound annual growth rate of 4 percent for the period between 2010 and 2013 (Capgemini & BNP Paribas 2016: 8-9). The data for the countries with the most non-cash transactions per capita are shown in Figure 13, below.

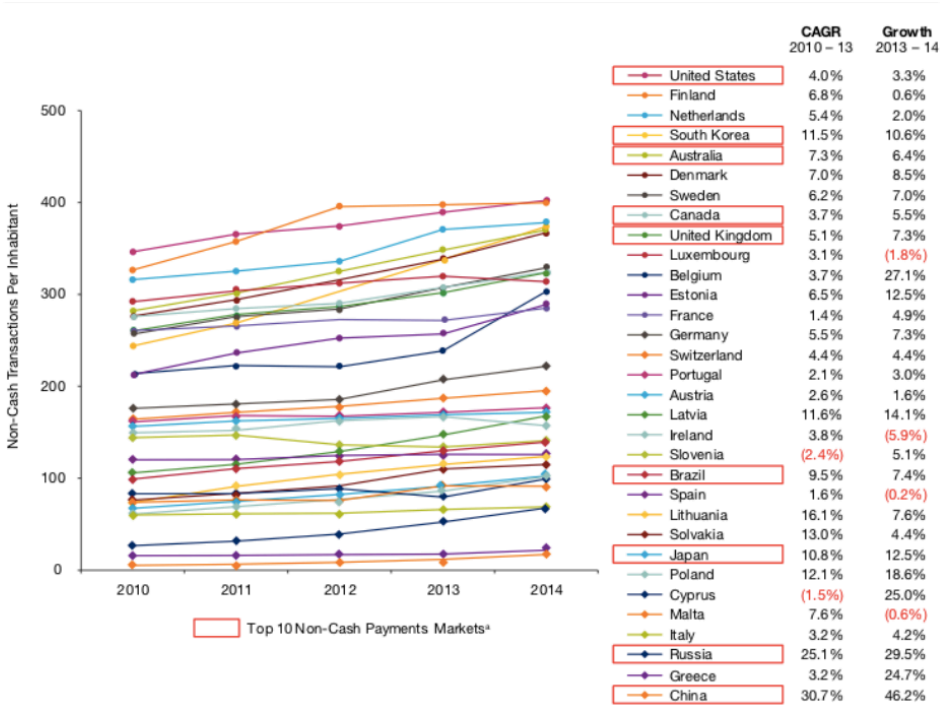

Figure 13. Non-cash payments per capita and CAGR for the period 2010-2013 (Capgemini & BNP Paribas 2016: 8).

While India is not mentioned in the list, data is provided for 23 countries from the EU amongst which Finland is the leader with only 2 transactions per capita less than the US (Capgemini & BNP Paribas, 2016: 8-9). The results from Figure 9, show that consumers both in the US and EU are starting to develop a preference for non-cash and particularly digital payments provided by Fintech companies (Capgemini & BNP Paribas, 2016: 8-9).

Additional evidence for the growing impact of digital non-cash payments on the financial services industry is the increased utilization of alternative payments methods provided by Fintech companies in India (Shah et al. 2016: 13-14). The growth of digital transactions is shown in Figure 14, below.

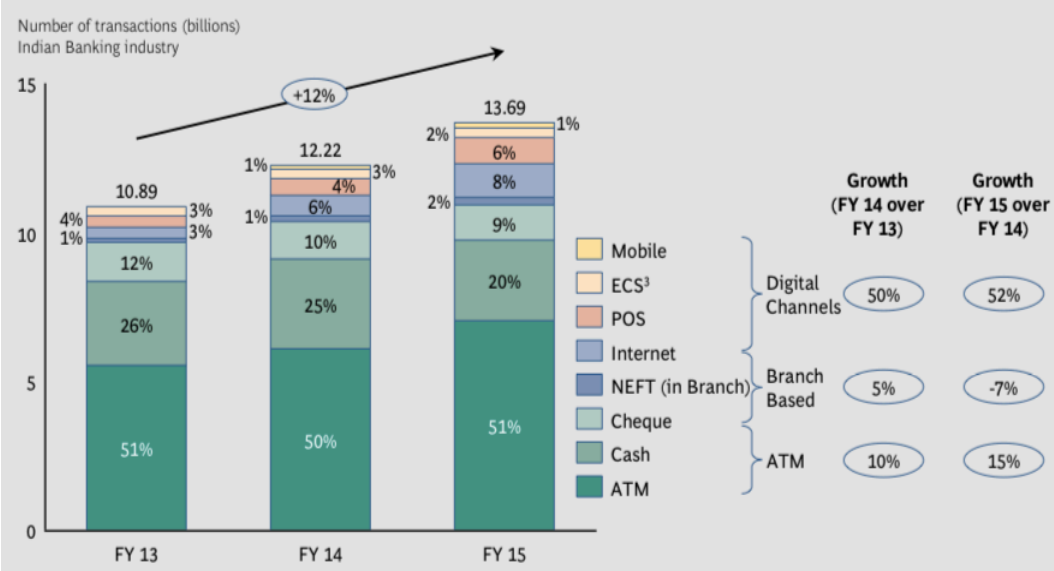

Figure 14. Growth of digital transactions in India for the period 2013-2015 (Shah et al. 2016: 13).

According to the data presented in the figure above, there have been a massive year-over-year growth in the number of transactions conducted via digital channels of 50-52 percent for the period 2013-2015 (Shah et al. 2016: 13-14). Additional evidence for the adoption of Fintech payments solutions is the projection that by 2020 transactions via digital channels will reach approximately $500 billion (Shah et al. 2016: 37). Taking both historical data and future projections regarding the increased influence of alternative payment solutions in India, it can be assumed that regulatory bodies in the country should start updating their frameworks in order to avoid potential fraudulent behaviour.

All the data provided in sub-subsection 2.5.2 referred to the alternative payment methods element of Fintech in the geographic and political regions of the EU, the USA and India. Empirical data regarding the element of Fintech that is examined in this research paper i.e. investment & banking is presented in sub-subsection 2.5.3.

2.6.3 Evidence for the potential of Fintech 'Investment and Banking' per region

The last element that is being examined in this research is that of 'Investment and Banking' services provided by Fintech companies. This element of Fintech includes mainly asset and wealth management services, financial planning and advisory and has a lot of potential as investments in its development have been growing constantly. According to KPMG 's report *"Value of Fintech"* (2017: 13), since 2010 approximately $11.4 billion have been invested in Fintech companies worldwide, which operate within the asset management sub-segment. These were private investments made by institutional investors (KPMG 2017: 13).

The rate of adoption for investment and banking services in 2017 (including saving and financial planning) appears to be higher among emerging economies such as China and India, whereas the US lags behind and countries from the EU are not even listed in the top five (EY 2017: 15). The data was collected from more than 23000 people in more than 20 countries worldwide and it is presented in Figure 15 below (EY 2017: 6).

	Money transfer and payments	Financial planning	Savings and investments	Borrowing	Insurance
1	China 83%	China 22%	China 58%	China 46%	India 47%
2	India 72%	Brazil 21%	India 39%	India 20%	UK 43%
3	Brazil 60%	India 20%	Brazil 29%	Brazil 15%	China 38%
4	Australia 59%	US 15%	US 27%	US 13%	South Africa 32%
5	UK 57%	Hong Kong 13%	Hong Kong 25%	Germany 12%	Germany 31%

Figure 15. Top five markets with the highest adoption rate per Fintech category (EY 2017: 15).

With an adoption rate of 20 percent, India is ranked third in the financial planning category and the US follows with an adoption rate of 15 percent (EY 2017: 15). In the savings and investments category India is ranked second with an adoption rate of 39 percent, whereas the US maintains the fourth place with an adoption rate of 27 percent

(EY 2017: 15). There are no representative countries from the EU that are ranked in the two aforementioned categories, which may signify that the adoption rate is low or that no data was available.

Nonetheless, data regarding the amount of assets under management in Fintech's investment and banking element is available for Germany. Due to the fact that Germany is the largest economy and one of the most politically influential countries within the EU, the data is considered to be relevant for examining the Fintech element mentioned above. The data is displayed in Figure 16, below.

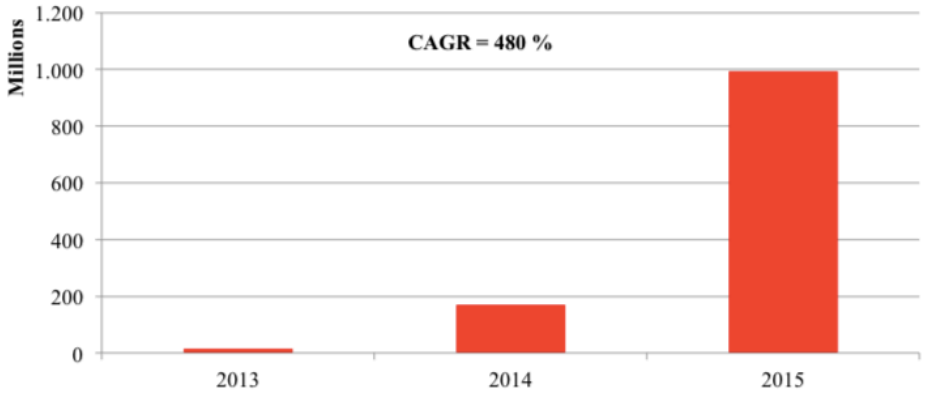

Figure 16. Assets under management in Fintech's investment and banking sub-segment in Germany for the period 2013-2015 (Dortfleitner et al. 2015: 41).

According to the results presented in the figure above, the assets under management in investment and banking Fintech firms had a compound annual growth rate of 480 percent between 2013 and 2015 and the value of assets under management in the sub-segment reached €1 billion (Dortfleitner et al. 2015: 41). This means that Germans are starting to adopt investment and banking services provided by Fintech companies.

However, the fact that there are many differences between EU member countries needs to be considered and although Germans may have a higher adoption rate, which may not be necessarily true for countries in the periphery of the EU.

2.7 Regulation status and potential negative effects of Fintech

The arguments discussed in the previous subsections provide the reasons behind the quick development and expansion of Fintech and its influence on traditional financial intermediaries. However, they focus mainly on the positive aspects of the elements of Fintech that are being examined in this paper i.e. blockchain & cryptocurrencies, alternative payments methods and investment & banking and fail to address any possible negative characteristics or repercussions related to these elements of Fintech.

In addition, majority of the authors and publications appear to display a certain degree of sympathy towards the development of the aforementioned Fintech elements. Such approach may have a distortive effect on the objectivity of the arguments. Some of the authors emphasize only the importance of traditional financial services institutions and use their books, journals, publications and reports to suggest strategies for the incumbents of the financial services sector on how to deal with the rapid development and expansion of Fintech.

However, one aspect that showcases the negative side of Fintech is regulation or rather the lack of it. Taking into account the fact that majority of the Fintech companies are not regarded as traditional financial services institutions, most of the EU's, India's and the US' current legislation concerning financial institutions' operations does not apply to them and that provides a loop that could be misused (Munteanu 2016: 43-47; Nathan Associates India 2017: 14-20). In order to determine and explain the potential negative effects that might arise from the lack of proper regulation, the current status of legislation regarding Fintech in the EU, USA and India is presented, followed by real-life examples where loops in regulation led to negative effects on the financial services sector.

Although, EU's commissioner for financial services Valdis Dombrovskis stated that Fintech and especially blockchain supported services bring great opportunities for the consumers and as such should be supported by EU's policy, he also acknowledged that future policy must include ways in which potential risks associated with the operations of Fintech companies would be mitigated (EC 2017).

A similar stance is also taken by Governor Lael Brainard of the Board of Governors of the US Federal Reserve whose, most growing concern are the potential problems Fintech

may cause regarding *"data privacy"* and *"cybersecurity"* (Federal Reserve 2016). The Reserve Bank of India is also supportive of Fintech as it considers its enormous potential, but it voices the same concerns as the US and the EU authorities, when it comes to the regulation of the segment (Reserve Bank of India 2016). These concerns are based on past experiences, due to the fact that traditional financial intermediaries have proven themselves as untrustworthy through putting their interests before those of their clients, thus showing the principal-agent theory in practice (Shah 2014: 2-3; Pouryousefi & Frooman 2017: 163-182).

However, there are other potential threats related to the operations of Fintech companies, which could not be explained by the principal-agent theory but may still have an effect on the global financial services sector and change it for the worse. These potential effects include: threats to cyber security, infringement of data privacy and possibilities for utilizing the services or products of Fintech companies for illegal purposes such as money laundering, contraband transactions and tax evasion (Vardi 2017: 32; Dodgson et al. 2015: 329; Campenon 2016: 109-110; Nakaso 2016: 6; Athey et al. 2016: 3-6).

Therefore, it is necessary that the existence of Fintech companies is *"legitimized"* and that they are bound by a suitable regulation, as all other providers of financial services (Mirmazaheri 2016: 175-194; Brunsden 2016). Otherwise, the lack of regulation may encourage risky behaviour and become a part of an already existing *"shadow banking"* system, which has an unfair competitive advantage over traditional banking and does not have to abide by the law (Panckhurst 2017: 25; Munteanu 2016: 43-47).

To initiate the process of legitimatization, the RBI has already established a *"Working Group on Fintech and Digital Banking"*, whose purpose is to closely follow the development of Fintech and try to suggest legislative solutions, which would be able to regulate Fintech companies and decrease the risk associated with the loss of data privacy and to mitigate cybersecurity risks (Reserve Bank of India 2016). Additionally, the RBI has prohibited the utilization of cryptocurrencies as a means of payment due to security, financial and legal risks (Deloitte 2017: 17). However, no other official regulation regarding Fintech has been issued nor implemented in India (Deloitte 2017: 16-17).

A more concrete course of action is taken by the regulatory bodies of the EU. As announced by the Commissioner, changes in the EU's financial institutions legislation have

been agreed upon and came into force at the beginning of 2018 (Arnold and Brunsden 2017). This new legislation known as PSD2 (the Second Payment Service Directive) *"is designed to boost competition in the name of 'open banking' by forcing banks to allow third parties, such as innovative financial technology companies, to access the data of customers who authorize it."* (Arnold and Brunsden 2017). Finally, in January 2018, both the PSD2 and the MiFID II directives came into force. The PSD2 legislation comes from the European Banking Authority (EBA) and sets the rules on what type of organisations can provide payment services within the European Economic Area (EEA) along with transparency requirements for those institutions (EBA 2018). The guidelines for the implementation of MiFID II on the other hand were drafted by the European Securities and Markets Authority (ESMA), and the main purpose of this legislative framework is to make investing more safe, transparent and fair by setting the requirements for investment institutions on how to conduct business and reporting along with rules on which financial instruments can be admitted for trading on EU and EEA financial markets (ESMA 2018). However, it remains to be seen whether Fintech companies would also face greater regulation in terms of customer data protection and privacy (Arnold and Brunsden 2017).

As far as the USA is concerned, their regulatory bodies have not yet given a clear statement on their plans regarding the regulation on Fintech, but they have mentioned that they are planning on taking a different route than the EU (Federal Reserve, 2016). Moreover, Fintech companies are not regulated nor supervised by a federal agency and only payment and lending Fintechs can be subjected to a limited number of federal regulations (Deloitte 2017: 5). Mainly these regulations refer to consumers' protection (Deloitte 2017: 6). Nonetheless, no other information is available on the US regulatory bodies' regulation plans for Fintech companies. This does not come as a surprise when taking into consideration that the US has always been more liberal when it comes to the regulation of the financial markets and the financial services sector (Denk & Gomes 2017: 11-12).

The announced amendments to the legislation in all three political and geographic entities are still quite vague and short-sighted, considering the fact that Fintech goes way beyond payment solutions, and also includes lending, asset & wealth management, brokerage services, cryptocurrency etc. (Mirmazaheri, 2016: 175-194). Most of these operations are also offered by traditional financial institutions. The unclear and complex nature of Fintech services along with the delayed research projects and legislative

measures that are to be implemented by the EU's, US' and India's authorities build a stable basis for a deeper research on the negative characteristics of Fintech. It is also suggested that regulation for Fintech start-ups should be updated regularly as a way to protect the consumers of high risks and impede fraudulent behaviour by all financial services' institutions, which may lead to another global financial crisis (Mirmazaheri, 2016: 175-194). In addition, there are already examples of situations where Fintech caused some negative effects.

The first real-life example emphasizes the threat of blockchain & cryptocurrencies being used for illicit actions such as contraband transactions, money laundering and tax evasion. It is related the use of the Bitcoin cryptocurrency for purchasing "*illegal substances such as drugs and firearms"* (Athey et al. 2016: 4). Namely, Bitcoins have been utilized as means of payment on *"illegal peer-to-peer market places such as the Silk Road, Silk Road 2, AgoraMarket and EvolutionMarket"* (Athey et al. 2016: 4). All of these websites were or are still located on the dark web and they serve as platforms for many illegal activities including but not limited to contraband and gambling (Athey et al. 2016: 4). The team of Athey et al. (2016), all researchers from the Stanford Graduate School of Business were only able to determine a small percentage of the total *"dollar value of transactions related to contraband and gambling"* and the absolute value of that percentage amounted to $11 billion (Athey et al. 2016: 4-5).

Another aspect of the usage of Bitcoin and other cryptocurrencies is international payments, which Athey et al., (2016: 4-5) were not able to analyze well, due to the fact that they lacked *"identity information"* because of the secretive nature of the cryptocurrency and the blockchain technology it uses. Blockchain technology allows complete anonymity and makes it difficult for authorities and researchers to trace the origin and the destination of the transactions (Athey et al. 2016: 3-6).

Another potential threat related to Fintech is cybersecurity and data privacy. Both of these concepts are related to one another and are very important for the general public and businesses worldwide (Prescott & Larose 2016). This especially holds true for Fintech companies, because they leverage the use of modern software and the internet to provide financial services at affordable prices (Prescott & Larose 2016).

This threat is exemplified by the case of Dwolla, a small Fintech start up from Iowa in the USA. Dwolla offered payment and money transfer solutions and assured its customers' transactions as well as their personal data are 'safe and secure' (Prescott & Larose 2016). However, this was not the case because later on they faced a cyberattack that put their customers' data privacy in jeopardy and showed that the company's cybersecurity system was outdated contrary to their clients' belief (Prescott & Larose 2016). The case of Dwolla caught the attention of the US Consumer Financial Protection Bureau (CFPB), which decided to undertake a *"data security enforcement action"* against Dwolla, which then led to the company being fined with $100 thousand (Prescott & Larose 2016).

This final subsection of the literature review presented the current status of Fintech regulation in the EU, USA and India and real examples of negative effects that arose from the lack of appropriate regulation. The analytical framework along with the methodology used for obtaining the data and information for analysis are described in the next chapter.

3 Analytical framework and methodology

This chapter of the thesis describes the analytical framework and methodology that are used in order to answer the research question: 'Could lack of proper regulation of Fintech lead to potential negative effects on the global financial services sector?'

3.1 Analytical framework of the research

The unit of analysis includes three geographical regions (the EU, India and the USA) and three elements of Fintech (blockchain & cryptocurrencies, alternative payment methods and investment & banking.) These regions are used as representative samples of developed and developing regions, to give a clearer picture of the state of the global financial services sector. The aforementioned elements of Fintech on the other hand are utilized due to the large amount of capital invested in those areas of Fintech, their high adoption rates and the growth in the number of digital payments, that were presented in Figures 5, 14 and 15 of the literature review. In addition, this evidence provides a reason why legislators and regulatory bodies in the aforementioned political and geographic regions

should be more concerned with the *"legitimization"* of Fintech and particularly of the elements mentioned above (Mirmazaheri 2016: 175-194; Brunsden 2016).

In order to address the research question and determine whether lack of proper regulation could lead to potential negative effects on the global financial services sector exemplified through the experiences of the EU, India and the USA an analytical framework is needed. Based on the reviewed literature, I start by defining the term financial intermediaries and the elements of Fintech that are relevant to this research and provide insights regarding Fintech's influence on the traditional financial intermediaries along with is positive characteristics. Afterwards, the reasons behind the fast expansion and development of Fintech are introduced in an attempt to better understand the Fintech segment. Additionally, empirical evidence regarding the increased importance of Fintech is used to demonstrate that there are reasons why people should remain somewhat skeptical when it comes to Fintech. When enormous amounts of resources are allocated into only one segment, it is important that people are aware of both the opportunities and threats related to it. Finally, the current status of Fintech regulation in the EU, India and the USA is examined. All the previous steps are necessary in order to determine the potential negative effects such as threats to cyber security, data privacy infringement and the use of Fintech companies' services for illegal purposes such as money laundering, contraband and tax evasion.

Analyzing the arguments in the literature review and the empirical data leads to the formation of the hypothesis that despite the opportunities they bring, Fintech's elements such as blockchain & cryptocurrencies, alternative payment methods and investment & banking could lead to negative effects on the financial services sector if they are not regulated properly. Those potential threats that could further damage the reputation of financial institutions and encourage irresponsible behaviour by some of the Fintech companies, which in turn would have a negative effect on people's trust in the global financial services sector and the financial system.

3.2 Methodology

The sources used in the literature review include academic research papers and journals, books, newspaper articles and consulting reports on the topics of Fintech, financial services sector and financial systems. Whilst authors such as Dortfletner et al., Thompson, King etc. focus on the positive effects and characteristics of Fintech, others such as Vasiljeva & Lukanova, Mirmazaheri, Athey et al. point out potential negative effects and characteristics of Fintech.

Due to the time constraints and complexity arising from the fact that Fintech is a rather new field of research I decided to rely on utilizing secondary data and information that were previously gathered by reputable institutions. These institutions include eminent consulting and auditing houses (Accenture, KPMG, EY, McKinsey, Deloitte etc.), the European Commission, the European Central Bank, the Federal Reserve of the USA, the Reserve Bank of India, Gallup, the Financial Times and Bloomberg. However, the utilized data is historical and as such it could be subject to errors and/or outdated.

In addition to quantitative data, I also used real-life examples to demonstrate the potential negative effects of Fintech. The potential negative effects that are being examined in this thesis are threats which are related to cybersecurity, infringement of data privacy and the utilization of Fintech services involving blockchain & cryptocurrencies, alternative payment methods and investment & banking for illegal purposes and activities such as tax evasion, money laundering and contraband transactions (Vardi 2017; Dodgson et al. 2015: 329; Campenon 2016: 109-110; Nakaso 2016: 6; Athey et al. 2016: 3-6). The negative effects mentioned above are considered as relevant choices, because the increased digitalization and usage of Fintech based services often requires people to share important personal data without actually providing specific information regarding the purposes for collection of said data or more insight on the data protection policy used by the companies (Gomber et. al 2018: 226-227).

However, considering the contemporary nature of the topic, there is still lack of reliable data and/or real-life examples that could give a more solid proof for the negative effects of Fintech. Thus, further detailed research in this field is required and highly recommended in order to be able to assess the potential threats realistically and to suggest preventive measures.

4 Findings

This chapter of the thesis summarizes the results of the research regarding the potential negative effects of the blockchain & cryptocurrencies, alternative payment methods and investment & banking elements of Fintech.

Krugman (2009: 154-160) and Pouryousefi & Frooman (2017: 163-182), who are cited in the literature review agree that financial services are a necessary part of people's lives. The most important functionality of such institutions is to facilitate the process of making transactions due to the risk of asymmetric information and moral hazard associated with transactions. This makes traditional institutions that provide financial services e.g. financial intermediaries an integral part of the financial system (Rosen 2013: 625).

Due to the fast development of technology and its deployment in the financial sector, new companies started emerging and offering similar or identical financial services seamlessly and at a much lower cost (PwC 2016: 3). These companies do not fit the mould of traditional financial services providers, because they mainly use advanced technology and the internet to satisfy the needs of consumers (PwC 2016: 3). Hence, they are classified under a separate segment of the financial services sector known as Fintech. As a segment Fintech has been growing exponentially and managed to reach $27.4 billion in investments in 2017 (Accenture 2018: 1). USA is the undisputable leader when it comes to venture capital investments in Fintech, while India is ranked third (Accenture 2018: 1). The EU on the other hand is lagging in terms of venture capital investments but takes the leading position in terms of investments made via ICOs (Atomico 2017: 11). Despite the sizable investments made in the segment, Fintech start-ups are still not completely ready to take on the traditional financial intermediaries that have an established political influence (Bugrov et al. 2017: 2-3). However, traditional financial services providers need to be aware that the expansion of Fintech occurs quickly and if they fail to improve their strategies and operations they will not be able to maintain their market share and Fintech companies could drive the profitability of the sector down (Bugrov et al. 2017: 2-3; Deloitte 2017: 3-4). King (2014: 240-250) states that as a result of a dedicated analysis of the traditional intermediaries' operating processes, Fintech disruptors are able to come up with creative financial services at an affordable price.

One of the main reasons for the quick expansion of Fintech is the declined level of trust that the populations have in the financial systems of the EU and the USA represented by the ECB and the Fed as a result of the financial crisis of 2008 that was followed by the Great recession (de Haan et al. 2015: 54-60; Petrakis et al. 2013: 274). EU and US citizens believe that these institutions failed them because they chose to bail out financial firms such as Merrill Lynch and AIG with tax-payers money (de Haan et al. 2015: 61). In the eyes of the general public, these institutions were to blame for the crisis due to their reckless behaviour and *'rent-seeking'* (Stan and McIntyre 2012: 19-20). There are no direct results regarding India and its population's trust in the RBI. However, India recovered quickly from the crisis because of its conservative banking rules (Goyal & Joshi 2012: 19-22).

Another reason for the rise and development of Fintech is the increased level of digitalization worldwide (BBVA Research 2017: 6-9). The USA is amongst the countries that have the highest level of digitalization, whereas the results for the EU vary as some countries such as Luxembourg and the Netherlands have extremely high levels of digitalization and others such as Bulgaria have a very low level of digitalization (BBVA Research 2017: 6-9). India on the other hand is at the bottom of the list when it comes to digitalization (BBVA Research 2017: 6-9).

The final reason for Fintech's expansion is the change in consumer behaviour that comes with the change of generations. Millennials represent nearly a quarter of the population in the EU, USA and India (UN Stats 2017; US Census Bureau 2015). This is a generation of digital natives, who prefer to handle their finances online and firmly believes in access over ownership (Suddath 2014: 5). Efma & Oracle Financial Services Software Limited (2010: 4) on the other hand claim that millennials only use basic banking services and prefer to spend money rather than save it. However, both sides agree that millennials are more demanding when it comes to the price-quality ratio and having grown with the internet, mobile technology and social media they can influence society through them and affect the financial services sector.

As previously mentioned, Fintech includes many elements such as crowdfunding, insurance, payments, blockchain & cryptocurrencies, investment & banking etc (Dortfleitner et al. 2017: 34-36). The most interesting and relevant elements of Fintech for this research are blockchain & cryptocurrencies, alternative payment methods and investment & banking when judged by investments made in those fields in the EU, USA and India, growing number of Fintech companies and the high adoption rates presented in Figures 4, 11 and 15 in the literature review. Investment in blockchain & cryptocurrencies is booming in the EU and the USA in the form of ICOs due to the fact that the blockchin technology eliminates the need for financial intermediaries (Atomico 2017: 17; Funderbeam 2017: 9; Atzori 2017: 46). There was an exponential growth in the market of cryptocurrencies from 2013 to 2017 followed by a surge in January 2018, when market capitalization reached $813 billion (CoinMarketCap 2018: 2). However, the surge was followed by an even bigger fall led by the decline in the price of Bitcoin (CoinMarketCap 2018: 2). People in the EU and the USA that owned and/or accepted cryptocurrencies as means of payment suffered great losses (Deloitte 2017: 14). No results are available for India, because the Indian authorities banned the use of cryptocurrencies as means of payment (Deloitte 2017: 14).

Alternative payment methods on the other hand is an element of Fintech, that is widely accepted among the populations of all three regions (Capgemini & BNP Paribas, 2016: 8-9). USA is the leader when it comes to non-cash payments per capita as depicted in Figure 13 of the literature review. From the EU countries Finland is ranked right behind the USA and it is apparent that the general public starts to prefer non-cash digital payments (Capgemini & BNP Paribas, 2016: 8-9). India also has had a big year-over-year growth of 50-52 percent in digital transactions for the period 2013 to 2017 (Shah et al. 2016: 13-14).

The last element of Fintech relevant to the research is investment & banking. It includes mainly financial advisory, asset and wealth management services. Around $11.4 billion have been invested in companies which offer asset management services (KPMG 2017: 13). The rate of adoption for Fintech investment & banking services is higher among emerging economies, placing India before the EU and the USA (EY 2017: 6).

Despite all the benefits that the aforementioned elements of Fintech bring, there are some downsides which could cause potential negative effects on the global financial

services sector. Namely, all three geographic and political entities examined in the research lack appropriate legislation that would regulate the operations of Fintech companies (Munteanu 2016: 43-47; Nathan Associates India 2017: 14-20). Representatives of the regulatory bodies of the EU, USA and India all agree that future policy and regulation updates are necessary, in order to be able to deal with potential risks and negative effects associated with Fintech companies' operations (EC 2017; Federal Reserve 2016; Reserve Bank of India 2016). The concerns are legitimate because they are based on past experiences when financial services providers put their interests own interests before the interests of their clients (Shah 2014: 2-3; Pouryousefi & Frooman 2017: 163-182). Considering the fact that we are living in the digital era there are also threats related to cybersecurity, infringement of data privacy and the possibility for utilizing Fintech services for illegal purposes (Vardi 2017: 32; Dodgson et al. 2015: 329; Campenon 2016: 109-110; Nakaso 2016: 6; Athey et al. 2016: 3-6). Thus, it is very important that the authorities of the EU, USA and India find a way how to legitimize the existence of Fintech companies and draft appropriate set of regulations (Mirmazaheri 2016: 175-194; Brunsden 2016). The RBI and the European commission have already created 'working groups' which would research and monitor Fintech operations, whereas the USA have not announced their plans (Reserve Bank of India 2016; Arnold and Brunsden 2017; Federal Reserve 2016). The EU has enforced the new PSD2 legislation, which legitimizes the work of Fintech companies that provide alternative payment methods and determines which organisations are eligible to provide payment services within the EU (Arnold and Brunsden 2017; EBA 2018). Given the broad scope and complexity of Fintech elements, more research on the potential negative characteristics of Fintech is necessary (Mirmazaheri, 2016: 175-194). There are already examples of how the lack of appropriate regulation of Fintech led to negative effects (Athey et al. 2016: 4). The examples include utilization of Fintech services for illegal purposes such as contraband, money laundering and tax evasion (Athey et al. 2016: 4) and the corruption of cybersecurity and infringement of data privacy (Prescott & Larose 2016).

5 Analysis and discussion

In this part of the thesis, information and data provided in the literature review is discussed and analysed respectively. Firstly, an analysis of the current status of Fintech's blockchain & cryptocurrencies, alternative payments methods and investment & banking is provided along with the positive aspects and effects that these Fintech elements have on the global financial services sector, exemplified through the experiences of the EU, USA and India. This is followed by a discussion and analysis of the potential negative effects of the previously mentioned elements of Fintech.

5.1 Current status of Fintech and its positive effects

As technology advances at an accelerated pace, Fintech is becoming a very important part of the global financial services sector, due to the fact that it provides ordinary people with limited knowledge of finance and banking, the opportunity to access different types of simple and affordable financial services of good quality (Skan et al. 2015: 3). This phenomenon started to occur because the general public's trust in both the financial system and the traditional financial intermediaries decreased dramatically (de Haan et al. 2015: 54-60). The decreased trust, on the other hand is a consequence of the unethical and morally questionable actions undertaken by many traditional intermediaries worldwide. These actions had negative repercussions, which later on led to the global financial crisis of 2007/08 (de Haan et al. 2015: 61). By undertaking such actions and then having the governments intervene and bail them out with tax-payers' money, these institutions jeopardized the livelihood of many people worldwide (de Haan et al. 2015: 54-61; Pajarskas & Jociene, 2014: 85-90). Therefore, the general public has been shifting its trust towards smaller Fintech companies instead (Skan et al. 2015: 3).

Decreased trust and increased suspicion towards the financial system and the traditional financial services providers has been especially visible in the USA and the countries of the EU. These two geographical and political entities were hit the hardest by the economic and financial crisis due to problems with subprime mortgages in the USA and sovereign debts of member countries in the EU (Glick & Spiegel 2009: 12). People from the Asian EMEs on the other hand, still appear to trust their financial systems and intermediaries (Glick & Spiegel 2009: 10-15). This holds especially true for India, which has

a very stable financial system, that did not crumble under the pressure of the global financial crisis of 2007/08 (Goyal & Joshi 2012: 19-22). Although, India did not have as many challenges as the USA and the EU, it was still affected by the crisis because of the volatility of the capital markets and the Indian firms' investments in the afore mentioned political and geographical entities (Glick & Spiegel 2009: 10-15). In addition, the credibility of the RBI was challenged by the rise in frauds in India's financial and banking sector at the beginning of the 2010s (Kaveri 2014: 15-17). Through the financial turmoil, smaller start-ups were able to thrive and prosper by using the internet and modern software to come up with innovations that would revolutionize the financial services and make them cheaper, faster and more accessible to a wider population (Zhang et al. 2015: 60-76). The rise of Fintech is mostly reflected in three of its elements i.e. blockchain & cryptocurrencies, alternative payment methods and investment & banking as the lion's share of investment in Fintech is directed towards them.

The blockchain technology is certainly the most sophisticated and revolutionary Fintech creation as it represents a decentralized database, where all transactions are conducted, confirmed and recorded anonymously within an open network (Atzori 2017: 45-46). The whole process is handled through cryptographic algorithms and human intervention is not needed at any point during the transaction, thereby eliminating the need for financial intermediation, which has been deeply embedded in the core of the financial services sector. Blockchain is used for the creation and maintenance of cryptocurrencies such as Bitcoin that are purely digital and decentralized and are not subject to government control or manipulation. The idea of a financial system that is free of intermediation is definitely appealing, given the fact that financial intermediaries have proven themselves to be untrustworthy and prone to taking on risks that they could not handle. In addition, using blockchain & cryptocurrencies reduces the costs associated with financial services. People's willingness to start utilizing blockchain & cryptocurrencies can be noticed through their investments in ICO projects in the EU, USA and India, which amounted to more than $2 billion in 2017 (see Figure 8).

Nonetheless, the most prominent and accepted element of Fintech is the alternative payment methods as proven by the fact that the majority of Fintech start-ups in the EU, India and the USA offer alternative payment solutions as their main service (see Figure 11). The advantage gained through usage of alternative payment solutions is the users' possibility to conduct and receive peer-to-peer payments seamlessly, quickly and at an

affordable price. Using alternative payment methods allows users to rely only on digital channels and saves them both time and money.

The investment & banking element of Fintech includes asset/wealth management and financial advisory and planning services. Fintech companies offer these services at a much lower price than traditional financial services by automating their operations and processes either partially or completely. This reduces the possibility for human errors and increases the accessibility and transparency of the banking business. This type of financial services appeals to digital natives, especially in developing countries such as India, but not so much to developed countries such as those of the EU and the USA (see Figure 15).

5.2 Inappropriate regulation and potential negative effects of Fintech

There are many positive characteristics, which justify people's willingness to adopt block-chain & cryptocurrencies, alternative payments solutions and Fintech investment and banking services. However, there are also threats related to this Fintech elements, which are rarely addressed but could have negative impact on the whole financial services sector. Potential negative effects are possible mainly due to the lack of appropriate regulation when it comes to the operations of Fintech companies, because technology develops and expands quickly and the regulatory bodies of the EU, USA and India are not able to keep up with it, because their regulations are tailored to the operations of traditional financial services providers. As a result, big number of Fintech companies are not legitimized and have the freedom to operate as they please.

A very good example of this is the blockchain & cryptocurrencies element, which is so sophisticated and advanced that only a handful of professionals are able to fully comprehend its real meaning and the purposes for which it can be used. Its anonymity and decentralized nature are useful when it comes to eliminating financial intermediation and cutting costs, but they can also be harmful as they can be used for illegal purposes such as money laundering, tax evasion and contraband transactions. A research by Athey et. al (2016: 4) showed that the Bitcoin has already been used as a means of payment for purchasing drugs and weaponry on dark-web platforms with an absolute value of $11 billion. Due to the anonymity feature of Bitcoin, the people who were guilty of those

actions could not be identified. The inability to trace the origin and destination of transactions makes it easier for people to commit financial crimes such as money laundering and tax evasion. Such actions could further diminish the general public's trust in the financial services sector and worsen the already fragile reputation of the sector.

Other very important threats related to Fintech are corruption of cybersecurity and data privacy infringement. In this era of digitalization and big data analytics, personal data is the holy grail not only for firms who want to obtain more customers but also for hackers and cybercriminals. A real-life example of corrupted cybersecurity and infringement of data privacy comes from the USA. A Fintech start-up, offering alternative payment solutions assured their clients that their data was safe, but when a cyberattack corrupted their cybersecurity system the company jeopardized the financial and personal data of its clients (Prescott & Larose 2016). This example shows why it is important for the authorities in the EU, USA and India to bind Fintech companies by regulations and demand that they provide top-notch cybersecurity and guarantee data privacy.

So far, the EU has had the most advancement when it comes to regulating by introducing the PSD2 legislation, which aims to regulate all the companies which provide payments including Fintech companies, which fit the profile described in the legislation. However, the PSD2 is not enough, because even after its introduction around 31 percent of a sample of 282 companies were not subject to any kind of regulation (see Figure 12). In addition, the PSD2 covers only payment solutions providers and there are many other elements of Fintech that have not been addressed. India, on the other hand has completely banned the usage of cryptocurrencies as means of payment and it has established a working group of professionals that monitor the Fintech segment. The working group is certainly a good start, but unfortunately nothing more was done afterwards in terms of regulation of Fintech. As far as the USA goes, no real progress has been made as Fintech companies are not regulated on a federal level and only some lending and payments providers are subject to consumers' protection regulations (Deloitte 2017: 5).

If the EU, India and the USA authorities do not take action and work on finding a suitable manner in which they could regulate all elements of Fintech including blockchain & cryptocurrencies, alternative payment methods and investment & banking, threats of cybersecurity corruption, data privacy infringement and utilization of Fintech services for illegal purposes could affect the financial services sector in a negative manner.

6 Conclusion

This thesis aimed to explore the potential negative effects of the blockchain & crypto-currencies, alternative payment methods and investment & banking elements of Fintech on the global financial services sector through the examples of the EU, India and the USA and attempted to answer the research question: 'Could lack of proper regulation of Fintech lead to potential negative effects on the global financial services sector?'

During the research it has been determined that majority of the literary sources were mainly focusing on the positive aspects of the aforementioned Fintech elements and only a handful of authors addressed the risks related to Fintech and the potential negative effects it could have on the financial services sector, which already has a bad reputation and its incumbents are blamed for causing the financial crisis of 2008.

Although, the research was limited by time and resources constraints, I managed to find relevant information and empirical evidence which examined the influence of Fintech companies on traditional financial services providers, the reasons behind Fintech's quick development and expansion along with details on the current status of Fintech regulation in the EU, USA and India. As a result of the research it was determined that current regulation of Fintech in the aforementioned regions is inappropriate and that it could lead to potential negative effects on the global financial services sector such as corruption of cybersecurity, infringement of data privacy and utilization of Fintech services for illegal purposes such as money laundering, tax evasion and contraband transactions. This statement is further supported by real-life examples of events when Fintech services were misused. Therefore, it can be concluded that indeed lack of proper regulation of Fintech could lead to potential negative effects on the global financial sector and further diminish people's trust in the financial services sector and the financial system.

Nonetheless, this thesis is only based on three elements of Fintech and focuses on samples from only three political and geographic regions i.e. the EU, India and the USA. Hence, further research and analysis of more arguments and data is necessary in order to be able to determine more potential negative effects that could arise from the lack of appropriate regulation of Fintech and to define measures with which the negative effects could be prevented.

7 References

Accenture. (2018). Global Venture Capital Investment in Fintech in 2017. [online] Available at: https://newsroom.accenture.com/news/global-venture-capital-investment-in-fintech-industry-set-record-in-2017-driven-by-surge-in-india-us-and-uk-accenture-analysis-finds.htm [Accessed 15 Apr. 2018].

Arnold, M. and Brunsden, J. (2017). *Fintech sector fears dilution of EU 'open banking' legislation*. [online] Ft.com. Available at: https://www.ft.com/content/65342eb2-e7ab-11e6-893c-082c54a7f539 [Accessed 21 Apr. 2017].

Athey, S., Parashkevov, I., Sarukkai, V. and Xia, J. (2016). *Bitcoin Pricing, Adoption, and Usage: Theory and Evidence*. [online] Available at: https://www.gsb.stanford.edu/faculty-research/working-papers/bitcoin-pricing-adoption-usage-theory-evidence [Accessed 30 Jul. 2017].

Atomico (2017). Europe leads the race to tokenize assets and the ICO fundraising boom - The State of European Tech 2017. [online] Available at: https://2017.stateofeuropean-tech.com/chapter/deep-tech/article/europe-front-and-centre-race-in-ico-boom/ [Accessed 11 Apr. 2018].

Atzori, M. (2017). *'Blockchain technology and decentralized governance: Is the state still necessary?*, Journal Of Governance And Regulation, Vol 6, Iss 1, Pp 45-62 (2017), 1, p. 45, Directory of Open Access Journals, EBSCOhost, [Accessed 27 Feb. 2018].

Azam, J, & Bhatia, K (2017). *'Provoking insurgency in a federal state: theory and application to India'*, 170, 3/4, pp. 183-210, EconLit with Full Text, EBSCOhost, [Accessed 7 March 2018].

BBC News (2015). *Why do many Americans mistrust the Federal Reserve? - BBC News*. [online] BBC News. Available at: http://www.bbc.com/news/business-35079495 [Accessed 9 Jun. 2017].

BBVA Research (2017). *DiGiX: The Digitization Index*. [online] Available at: https://www.bbva-research.com/wp-content/uploads/2017/02/WP_17-03_DiGiX_methodology.pdf [Accessed 9 Aug. 2017].

Brunsden, J. (2016). *New EU laws legitimise fintech challengers*. [online] Ft.com. Available at: https://www.ft.com/content/3803914a-6eba-11e6-a0c9-1365ce54b926 [Accessed 18 Apr. 2017].

Bugrov, D., Dietz, M. and Poppensieker, T. (2017). *A brave new world for global banking*. [online] McKinsey & Company. Available at: http://www.mckinsey.com/industries/financial-services/our-insights/a-brave-new-world-for-global-banking [Accessed 28 Mar. 2017].

Campenon, B. (2016). Fintech and the future of securities services. *Journal of Securities Operations & Custody*, 8(2), pp.107-112.

Canaday, T (2017), *'Evolving a payments business to meet the demands of a distributed economy'*, Journal Of Payments Strategy & Systems, 11, 1, pp. 15-22, Business Source Ultimate, EBSCO*host*, [Accessed 7 March 2018].

Capgemini & BNP Paribas (2016). *World Payments Report 2016*. [online] Available at: http://www.astrid-online.it/static/upload/worl/world_payments_report_wpr_2016.pdf [Accessed 16 Mar. 2018].

Cesifo-group.de. (2011). *Trust in European Institutions: The European Central Bank.* [online] Available at: https://www.cesifo-group.de/ifoHome/publications/docbase/details.html?docId=17566119 [Accessed 25 Mar. 2017].

CJEU (2015). *The exchange of traditional currencies for units of the 'bitcoin' virtual currency is exempt from VAT*. [online] Available at: https://curia.europa.eu/jcms/upload/docs/application/pdf/2015-10/cp150128en.pdf [Accessed 9 Jul. 2017].

Davies, S., Kashyap, M., Roets, M. and Ruetschi, J. (2016). *2016 Financial Services Trends*. [online] Strategyand.pwc.com. Available at: http://www.strategyand.pwc.com/trends/2016-financial-services-trends [Accessed 28 Mar. 2017].

de Haan, J., Oosterloo, S. and Schoenmaker, D. (2015). *Financial markets and institutions (a European perspective)*. 3rd ed. Cambridge: Cambridge University Press.

Deloitte. (2017). *"Regulatory Sandbox – Making India a Global Fintech Club"*. [online] Available at: https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-fintech-regulatory-sandbox-web.pdf [Accessed 24 Mar. 2018].

Deloitte. (2017). *Fintech by numbers*. [online] Available at: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-dcfs-fintech-by-the-numbers-web.pdf [Accessed 1 Apr. 2018].

Deloitte. (2017). *Fintech Regulatory Environment | Deloitte US*. [online] Available at: https://www2.deloitte.com/us/en/pages/regulatory/articles/fintech-risk-management.html [Accessed 12 Apr. 2018].

Denk, O, & Gomes, G (2017). *'Financial regulation after the crisis: Still liberal, but..'*, OECD Observer, 311, pp. 11-12, Business Source Ultimate, EBSCOhost, [Accessed 18 March 2018].
Dodgson, M., Gann, D., Waldawsky-Berger, I., Sultan, N. and George, G. (2015). Managing Digital Money. *Academy of Management Journal*, 58(2), pp.325-333.

Dorfleitner, G., Hornuf, L., Schmitt, M. and Weber, M. (2017). FinTech in Germany. Springer Nature.

EBA. (2017). *Discussion paper on the EBA's approach to financial technology (FinTech)*. [online] Available at: http://www.eba.europa.eu/documents/10180/1919160/EBA+Discussion+Paper+on+Fintech+%28EBA-DP-2017-02%29.pdf [Accessed 23 Mar. 2018].

EBA. (2017). EBA publishes final Guidelines on security measures under PSD2. [online] Available at: https://www.eba.europa.eu/-/eba-publishes-final-guidelines-on-security-measures-under-psd2 [Accessed 18 Apr. 2018].

EC (2017). *Vice President's speech at the conference #FINTECHEU "Is EU regulation fit for new financial technologies?"* [online] European Commission. Available at: https://ec.europa.eu/commission/commissioners/2014-2019/dombrovskis/announcements/vice-presidents-speech-conference-fintecheu-eu-regulation-fit-new-financial-technologies_en [Accessed 12 Jul. 2017].

ECB (2017). *Communicating the complexity of unconventional monetary policy in EMU*. [online] Available at: https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp171115.en.html [Accessed 24 Feb. 2018].

Efma and Oracle Financial Services Software Limited (2010). *Are Banks ready for the Next Generation Customer?* [online] Efma and Oracle Financial Services Software Limited, pp.4-17. Available at: http://www.oracle.com/us/industries/financial-services/gen-y-survey-report-165297 [Accessed 7 Apr. 2017].

ESMA. (2018). *MiFID II*. [online] Available at: https://www.esma.europa.eu/policy-rules/mifid-ii-and-mifir [Accessed 4 Mar. 2018].

EUR-lex (2012). *EUR-Lex - 32012R0648 - EN - EUR-Lex*. [online] Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32012R0648 [Accessed 10 Jul. 2017].

European Central Bank. (2017). *Financial intermediaries*. [online] Available at: https://www.ecb.europa.eu/mopo/eaec/intermediaries/html/index.en.html [Accessed 24 Mar. 2017].

European Parliament (2016). *MEPs call for virtual currency watchdog to combat money laundering and terrorism | News | European Parliament*. [online] Available at: http://www.europarl.europa.eu/news/en/news-room/20160524IPR28821/meps-call-for-virtual-currency-watchdog-to-combat-money-laundering-and-terrorism [Accessed 8 Jul. 2017].

EY (2013). *Dodd-Frank's Title VII — OTC derivatives reform*. [online] Available at: http://www.ey.com/Publication/vwLUAssets/Key_questions_board_members_should_ask_about_Title_VII/$FILE/Americas_FAAS_Dodd_Frank_derivatives_reform.pdf [Accessed 11 Jul. 2017].

EY. (2017). Fintech Adoption Index. [online] Available at: http://www.ey.com/Publication/vwLUAssets/ey-fintech-adoption-index-2017/$FILE/ey-fintech-adoption-index-2017.pdf [Accessed 14 Feb. 2018].

Federal Reserve (2016). *Speech by Governor Brainard on the opportunities and challenges of fintech*. [online] Board of Governors of the Federal Reserve System. Available at: https://www.federalreserve.gov/newsevents/speech/brainard20161202a.htm [Accessed 23 Jul. 2017].

Funderbeam. (2017). *Funding report*. [online] Available at: http://3tscapital.com/wp-content/uploads/2017/12/ICO-Funding-Report-2017.pdf [Accessed 10 Apr. 2018].

Gallup (2013). *Americans Sour on IRS, Rate CDC and FBI Most Positively*. [online] Gallup.com. Available at: http://www.gallup.com/poll/162764/americans-views-irs-sharply-negative-2009.aspx [Accessed 1 Aug. 2017].

Glick, R. and Spiegel, M. (2009). *Asia and the Global Financial Crisis*. [online] Available at: http://www.frbsf.org/economic-research/files/Conference_volume.pdf [Accessed 9 Jul. 2017].

Gomber, P, Kauffman, R, Parker, C, & Weber, B (2018). *'On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services', Journal Of Management Information Systems,* 35, 1, pp. 220-265, Business Source Ultimate, EBSCOhost, [Accessed 30 March 2018].

Goyal, K. and Joshi, V. (2012). Indian Banking Industry: Challenges And Opportunities. *International Journal of Business Research and Management*, 3(2), pp.19-22.

Harris, J. (2015). *London beats New York to top financial centre in the world*. [online] Cityam.com. Available at: http://www.cityam.com/224938/london-top-world [Accessed 12 Apr. 2017].

IRS (2016). IRS Virtual Currency Guidance: Virtual Currency Is Treated as Property for U.S. Federal Tax Purposes; General Rules for Property Transactions Apply. [online] Available at: https://www.irs.gov/uac/newsroom/irs-virtual-currency-guidance [Accessed 8 Jul. 2017].

Kaveri, VS (2014). *'Bank Frauds in India: Emerging Challenges'*, Journal Of Commerce & Management Thought, 5, 1, pp. 14-26, Business Source Ultimate, EBSCOhost, [Accessed 11 March 2018].

Kay, J (2010). *'Narrow Banking'*, World Economics, 11, 1, pp. 1-10, Business Source Ultimate, EBSCO*host*, [Accessed 8 March 2018].

King, B. (2014). *Breaking Banks*. 1st ed. Hoboken: Wiley, pp.240-250.

Konigsheim, C, Lukas, M, & Noth, M (2017). *'Financial Knowledge, Risk Preferences, and the Demand for Digital Financial Services'*, Schmalenbach Business Review, 18, 4, pp. 343-375, EconLit with Full Text, EBSCOhost, [Accessed 8 March 2018].

KPMG (2016). *Fintech in India - A global growth story*. [online] Available at: https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/FinTech-new.pdf [Accessed 12 Jun. 2017].

KPMG International (2017). *The pulse of Fintech Q4 2016. Global analysis of investment in Fintech*. [online] Available at: https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/pulse-of-fintech-q4-2016.pdf [Accessed 1 Aug. 2017].

KPMG. (2017). *Value of Fintech*. [online] Available at: https://assets.kpmg.com/content/dam/kpmg/uk/pdf/2017/10/value-of-fintech.pdf [Accessed 24 Mar. 2018].

Krugman, Paul (2009). *The Return of Depression Economics and the Crisis of 2008*. W.W. Norton Company Limited.

Mirmazaheri, S. (2016). How FinTech Firms Provide a New Path to Regulatory Relief for Banks. *Review of Banking & Financial Law*, 36(1), pp.175-194.

Mohammad, S (2014). *'Liquidity creation and liquidity risk exposures in the banking sector: a comparative exploration between Islamic, conventional and hybrid banks in the Gulf Corporation Council region*', British Library EThOS, EBSCOhost, [Accessed 27 Feb. 2018].

Munteanu, B. (2016). Shadow Banking – Developments in Times of Financial Crisis. *"Ovidius" University Annals, Economic Sciences Series*, 16(2), pp.43-47.

Nakaso, H. (2016). *FinTech and the Future of Money*. [online] Available at: https://www.boj.or.jp/en/announcements/press/koen_2016/data/ko161118a.pdf [Accessed 24 Jun. 2017].

Nathan Associates India (2017). *Fintech in India - An analysis of the market, and of the UK's role in supporting its development*. [online] Available at: http://www.nathanlondon.co.uk/wp-content/uploads/2017/02/Nathan-Associates-Fintech-in-India.pdf [Accessed 4 Jul. 2017].

Nicoletti, B (2017). *The Future Of Fintech: Integrating Finance And Technology In Financial Services* / Nicoletti, Bernardo, n.p.: Cham Springer, [2017], HoWeR, EBSCOhost, [Accessed 5 April 2018].

Pajarskas, V. and Jociene, A. (2014). Subprime Mortgage Crisis In the United States In 2007-2008: Causes and Consequences (Part I). *Ekonomika/Economics*, 93(4), pp.85-118.

Panckhurst, P. (2017). *Shadow Banking*. [online] Bloomberg View. Available at: https://www.bloomberg.com/quicktake/shadow-banking [Accessed 21 Apr. 2017].

Pasztor, J (2018). *'Bitcoin Investing--An Ethical and Regulatory Quandary'*, Journal Of Financial Service Professionals, 72, 2, pp. 30-33, Business Source Ultimate, EBSCO*host*, [Accessed 4 March 2018].

Petrakis, P., Kostis, P, Valsamis, D., (2013). *European Economics and Politics in the Midst of the Crisis; From the Outbreak of the Crisis to the Fragmented European Federation*, p.274, Springer.

Pouryousefi, S. and Frooman, J. (2017). *The Problem of Unilateralism in Agency Theory: Towards a Bilateral Formulation*. pp.163-182.

Prescott, N. and Larose, C. (2016). *FinTech Companies Face Big Privacy Challenges in 2016*. [online] VC Experts Blog. Available at: https://blog.vcexperts.com/2016/08/09/fintech-companies-face-big-privacy-challenges-in-2016/ [Accessed 6 Jul. 2017].

PwC. (2016). *Global FinTech Report: PwC*. [online] Available at: http://www.pwc.com/gx/en/industries/financial-services/fintech-survey/report.html [Accessed 25 Mar. 2017].

PwC. (2017). *Global Fintech Report*. [online] Available at: https://www.pwc.com/jg/en/publications/pwc-global-fintech-report-17.3.17-final.pdf [Accessed 10 Apr. 2018].

Rao, PS (2017). *'Infrastructure, Growth and Poverty Nexus in India: A State-Level Analysis'*, IUP Journal Of Applied Economics, 16, 4, pp. 41-75, Business Source Ultimate, EBSCOhost, [Accessed 11 March 2018].

Reklaitis, V. (2017). *How Berlin's fintech scene could gain from Brexit*. [online] Fnlondon.com. Available at: https://www.fnlondon.com/articles/how-berlins-fintech-scene-could-gain-from-brexit-20170310 [Accessed 10 Apr. 2017].

Reserve Bank of India (2016). *Reserve Bank of India - Press Releases*. [online] Rbi.org.in. Available at: https://www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=37493 [Accessed 27 Jul. 2017].

Reutter, T and Flühmann D (2017). *'Switzerland: Initial coin offerings'*, International Financial Law Review, p. 1, Business Source Ultimate, EBSCOhost, viewed 14 March 2018.

Rosen, KM (2013). *Financial Intermediaries as principals and agents*, Wake Forest Law Review, 48, 3, pp. 625-642, Business Source Ultimate, EBSCOhost, [Accessed 27 Feb. 2018].

Sahoo, PK (2017). *'Bitcoin as digital money: Its growth and future sustainability'*, *Theoretical & Applied Economics*, 24, 4, pp. 53-64, Business Source Ultimate, EBSCO*host*, [Accessed 4 March 2018].

Saunders, M., Lewis P., and Thornhill A. (2016) Research Methods for Business Students, 7th ed. Harlow: Pearson.

Shah, A., Vibha, K., Prateek, R., Abhishek, A. and Chilman, J. (2016). *Digital Payments 2020: The making of a $500 billion ecosystem in India*. [ebook] Boston Consulting Group and Google. Available at: http://image-src.bcg.com/BCG_COM/BCG-Google%20Digital%20Payments%202020-July%202016_tcm21-39245.pdf [Accessed 16 Mar. 2018].

Shah, S. (2014). *The Principal–Agent Problem in Finance (a summary)*. [online] Available at: https://www.cfainstitute.org/learning/foundation/research/Documents/principal-agent_problem_in_finance.pdf [Accessed 9 Jul. 2017].

Singh, B. (2017). Leveraging FinTech opportunities in India. *Journal of Information Science Theory & Practice*, pp.47-49.

Skan, J., Dickerson, J. and Masood, S. (2015). *Future of FinTech and Banking - Accenture*. [online] Accenture.com. Available at: https://www.accenture.com/us-en/insight-future-fintech-banking [Accessed 27 Mar. 2017].

Sontakke, K, & Ghaisas, A (2017), *'Cryptocurrencies: A Developing Asset Class'*, International Journal Of Business Insights & Transformation, 10, 2, pp. 10-17, Business Source Ultimate, EBSCO*host*, [Accessed 4 March 2018].

Stan, M, & McIntyre, M (2012), *'Too big to fail? Size and risking'*, Academy Of Banking Studies Journal, 11, 2, pp. 11-21, Entrepreneurial Studies Source, EBSCOhost, [Accessed 9 March 2018].

Suddath, C. (2014). *The Millennial Way of Shopping: More Careful, Durable, and Frugal Than You Think*. [online] Bloomberg.com. Available at: https://www.bloomberg.com/news/articles/2014-04-25/millennials-are-careful-frugal-shoppers-who-buy-for-the-long-term [Accessed 25 Mar. 2017].

the Guardian (2013). *The bank bailout cost US taxpayers nothing? Think again | Moira Herbst*. [online] the Guardian. Available at: https://www.theguardian.com/commentisfree/2013/may/28/bank-bailout-cost-taxpayers [Accessed 9 Jun. 2017].

the Guardian. (2009). *Global measures to tighten up financial regulation*. [online] Available at: https://www.theguardian.com/business/2009/jun/18/financial-regulation-america-uk-europe [Accessed 28 Mar. 2017].

The Times of India (2013). *No move to regulate Bitcoins: RBI - Times of India*. [online] Available at: http://timesofindia.indiatimes.com/business/india-business/No-move-to-regulate-Bitcoins-RBI/articleshow/28071044.cms [Accessed 9 Jul. 2017].

Thompson, K (2017). *'Wealth management advice in the digital age',* Journal Of Securities Operations & Custody, 10, 1, pp. 6-11, Business Source Ultimate, EBSCOhost, [Accessed 7 March 2018].

UN Stats (2017). *United Nations Statistics Division - Demographic and Social Statistics*. [online] Unstats.un.org. Available at: http://unstats.un.org/unsd/demographic/products/dyb/dyb2.htm [Accessed 9 Jul. 2017].

US Census Bureau (2015). *Millennials Outnumber Baby Boomers and Are Far More Diverse*. [online] The United States Census Bureau. Available at: https://www.census.gov/newsroom/press-releases/2015/cb15-113.html [Accessed 14 Jul. 2017].

Vardi, M. (2017). Cyber Insecurity and Cyber Libertarianism. *Communications of the ACM*, 60(5), p.5.

Vasiljeva, T, & Lukanova, K (2016). '*Commercial Banks and Fintech companies in the digital transformation: Challenges for the future'*, Journal Of Business Management, 11, pp. 25-33, Business Source Ultimate, EBSCOhost, [Accessed 7 March 2018].

Wooley, P., Wadhwani, S., Goodhart, C., Turner, A. and Haldane, A. (2010). *The future of finance. The LSE Report*. [London]: London School of Economics.

Zhang, B., Wardrop, R., Rau, R. and Gray, M. (2015). Moving mainstream: benchmarking the European alternative finance market. *EY: Journal of financial perspectives*, pp.60-76.