FINTECH AND FINTECH ECOSYSTEM: A REVIEW OF LITERATURE

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Abstract

This research aims to suggest a definition of FinTech, stating its main attributes based on the theoretical development of the field in academia. A systematic literature review (SLR) with the qualitative content analysis (QCA) method analyses about 22 research papers. These papers were selected based on the number of citations and their metrics, such as impact factors. After analyzing the literature, a definition of FinTech ecosystem is suggested with the roles played by stakeholders, for instance, lawmakers, information technology (IT) companies, traditional financial institutions, financial customers and investors affecting FinTech. This definition considers the framework offered by Au and Kauffman (2008). Further, the authors identify FinTech as a disruptive innovation and outline the main business models where FinTech operate blockchain, crowdfunding, payments, insurance, wealth and asset management, big data analysis, and application programming interface (API) are discussed with the roles they play. Lastly, competitive advantages and challenges encountered by FinTech are discussed which is an extension of work by Gomber, Koch, and Siering (2017). Further research can be done to understand the nature of each FinTech category and see the impact of regulations and collaborations on the economy and society.

Keywords: FinTech, Financial Ecosystem, Disruptive Innovation, Industry Convergence

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1. INTRODUCTION

The word FinTech is the combination of the words financial and technology. Some authors use the work BankTech as a synonym of Fintech (Zavolokina, Dolata, & Schwabe, 2016). This term is used to describe new technology that seeks to improve and automate the processes of financial services and delivery. As the name shows, FinTech is the merging of technology and finance. FinTech is presumed to be the rival of the bank as they are replacing the services provided by the banks with innovative products and services (Puschmann, 2017).

Many researchers agree that FinTech's solutions are customer-centric (Puschmann, 2017). Therefore, it is about improving the services for the consumers rather than improving for the financial institutions (Thakor, 2020). Thus, digital innovation and technology enabled the development of FinTech business models. This innovation has disrupted the financial structure and the ecosystem as a whole. As a result, the industry's boundaries are blurred and lead to the convergence of two industries, information technology (IT) and finance.

In this paper, the authors aim to find out what academia says about FinTech which will take into account the attributes of FinTech that make it different from traditional financial institutions as existing research does not consider all the attributes. In addition to the attributes, the authors have also defined the FinTech ecosystem concept which includes all the stakeholders which directly or indirectly impact FinTech as the authors did not find such a concept in the existing literature. Furthermore, the authors summarized the most frequent business models according to the literature. The authors did not find any such summary in the current published research. Moreover, some researchers identified FinTech as disruptive innovation as was discovered by Christensen (Au & Kauffman, 2008) whereas some identified it as industry convergence the concept coming from Rosenberg (Weaver, 2007) and some identified FinTech as both. Based on these publications, the authors of this paper will make the case that the profile of FinTech fits better with the disruptive innovation model. Lastly, the authors have summarized the competitiveness and challenges faced by FinTech.

Therefore, the following are the research questions:

RQ1: What is FinTech and its FinTech ecosystem and what are FinTech's characteristics/attributes according to the literature?

RQ2: Who are the relevant stakeholders in the FinTech ecosystem and what challenges are faced by FinTech in the financial ecosystem?

RQ3: Is FinTech a disruptive innovation or industry convergence? Or both?

RQ4: What are the main FinTech business models?

RQ5: In which ways FinTech are more competitive with other financial institutions from the user's perspective?

Subsequently, to answer these questions, the authors have carried out the systematic literature review (SLR) along with the qualitative content analysis (QCA) and frequency analysis.

As a result, this research paper defines FinTech with all the possible attributes and FinTech ecosystem which was not clarified by earlier research in academia. Furthermore, the authors recognize FinTech as an IT company and conclude that most FinTechs are in the area of lending, risk management, robo-advising and cryptocurrency. Lastly, the authors identified that the unique selling point (USP) of FinTech in comparison to other financial institutions is its innovativeness, improved profitability, reduced cost and efficiency. However, on the other hand, the main challenges are in terms of stability, upcoming regulations and cyber security.

This paper can be beneficial to investors, consultants and financial institutions who are considering investing in FinTech. Also, it could be relevant to financial institutions which are analyzing how they should compete and collaborate with FinTech. Also, regulators can benefit from it when planning a new normative framework and academicians by use it as a basis for further research and teaching.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 analyses the methodology that has been used to conduct empirical research on FinTech. Section 4 focuses on the results achieved by the implementation of the methodology mentioned. Section 5 is the discussion based on the results achieved by answering the research questions followed by Section 6 which is the paper's conclusion and proposes avenues for further research.

2. LITERATURE REVIEW

2.1. What is FinTech?

FinTech is a company that is using technology to provide financial solutions using the internet and automated processing of information (Gabor & Brooks, 2017; Milian, Spinola, & de Carvalho, 2019; Zavolokina et al., 2016; Alt, Beck, & Smits, 2018; Gomber, Kauffman, Parker, & Weber, 2018; Puschmann, 2017).

This innovation in the financial industry has led to cost reduction, high efficiency, rapidity, innovation, flexibility and improvement in the business processes (Zavolokina et al., 2016; Lee & Shin, 2018; Thakor, 2020).

FinTech also embeds innovations in financial education and literacy, investments, retail banking and cryptocurrencies (Gomber et al., 2018).

The business models have transformed to provide customized services to the consumers without geographic or time-zone barriers as most of the services are automated. In addition, FinTech has helped in disintermediation (Thakor, 2020) and provided online platforms for trading, lending (crowdfunding and peer-to-peer, P2P) and asset management, for instance, robo-advising (Gomber et al., 2018; Alt et al., 2018; Lee & Shin, 2018; Puschmann, 2017). This intermediation is also achieved by infrastructure development, data analytics, big data and mobile devices (Lee & Shin, 2018).

2.2. FinTech stakeholders and ecosystem

The FinTech ecosystem is the complex network of interaction between FinTech startups, regulators, investors, government and talented institutions with a common interest in the FinTech startups ecosystem. No specific definition was found in the literature regarding the FinTech ecosystem. However, various stakeholders were identified in academics.

Banks and other financial institutions have limitations due to high regulations imposed on this industry (Leong, Tan, Xiao, Tan, & Sun, 2017; Puschmann, 2017; Alt et al., 2018; Goldstein, Jiang, & Karolyi, 2019; Jagtiani & Lemieux, 2018). The financial institutions include insurance companies, banks, credit grantors and exchanges (Alt et al., 2018; Lee & Shin, 2018). In addition, FinTech is helping its consumers to handle their assets by themselves by providing them with automated platforms. These platforms use robo-advisors and are run based on certain algorithms (Gabor & Brooks, 2017). These are automatic and have replaced wealth and asset managers (Goldstein et al., 2019; Gomber et al., 2018). On the other hand, bankers are very interested in FinTech as they may consider having strategic partnerships with FinTech as a potential strategic direction (Anagnostopoulos, 2018).

Consumer interest is increasing towards availing of the services offered by FinTech which as a result promotes FinTech development. One reason behind this is fewer regulations for time being as compared to the incumbent, banking industry (Alt et al., 2018; Milian et al., 2019; Zavolokina et al., 2016; Leong et al., 2017; Jagtiani & Lemieux, 2018). These consumers are both individuals and merchants or businesses (Au & Kauffman, 2008; Alt et al., 2018; Lee & Shin, 2018).

The services provided by FinTech are in collaborations with the mobile network operators, software and technology providers, mobile device manufacturers, IT developers (Lee & Shin, 2018; Shim, 2016) with limited regulations by the government and the regulators (Zavolokina et al., 2016; Leong, 2017; Lee & Shin, 2018; Goldstein et al., 2019). The regulators, government agencies and public sector entities keep a track of the quality of the innovation, come up with laws and track sales practices (Au & Kauffman, 2008; Zavolokina et al., 2016; Anagnostopoulos, 2018; Gomber et al., 2018; Gabor & Brooks, 2017; Ozili, 2018).

The emergence of FinTech has helped businesses to reduce costs and increase profitability resulting in attracting investors (Haddad & Hornuf, 2019; Alt et al., 2018) and media. These investors are not only interested due to the profitability but also because it is beneficial for society too. To elaborate further, FinTech has provided alternative opportunities to underserved societies where people, for example, do not have bank accounts. For instance, people who do not get loans from traditional banks for home mortgages turn to shadow banks and FinTech shadow banks which tend to give them loans without any requirement of collating and bank account. However, on the other hand, these loans charge higher interest which in turn attracts a certain segment of the investors (Buchak, Matvos, Piskorski, & Seru, 2018).

Moreover, philanthropic investors are also keen on FinTechs (Gabor & Brooks, 2017). The reason behind it is that FinTech makes it easy to do the charity at the convenience and low cost no matter what their income level is. This emerging and innovative industry has caught the media's attention as well due to the innovative and appealing solutions for the general public (Au & Kauffman, 2008; Zavolokina et al., 2016; Gabor & Brooks, 2017).

FinTech uses big data analytics to better understand the consumers' behaviours, needs and demands to come up with the best possible solutions, which were once done by the big data companies and cloud technology companies (Leong et al., 2017; Shim, 2016).

By the end of the day, FinTech has affected the general public as a whole, not just the consumers only (Haddad & Hornuf, 2019) or small and mid-size enterprises (SMEs) (Ozili, 2018). It played a vital role in making payments to non-governmental organizations (NGOs) and charities as it is efficient, fast with low transaction costs as it is not associated with the bank account (Gomber et al., 2018).

Despite all the positive aspects mentioned, FinTech is alleged for promoting illegal transactions via bitcoins. It is estimated that 46% of bitcoin transactions are associated with illicit activities. Moreover, with the emergence of more cryptocurrencies, the facilitation of payments for illegal transactions is enhanced. Therefore, strict surveillance and regulations are required to limit the mentioned activities (Foley, Karlsen, & Putnins, 2019).

2.3. Is FinTech a disruptive innovation or industry convergence? Or both?

As per Christensen, (as cited in Au & Kauffman, 2008; Shin & Lee, 2011; Anagnostopoulos, 2018) when a small company that has fewer resources can challenge the established business, also known as the incumbent, and continue to move-up market, the process is called disruptive innovation. As a result, new business models promise efficiency, security, more flexibility and thus, opportunity (Gomber et al., 2017; Milian et al., 2019; Lee & Shin, 2018) and profitability (Gomber et al., 2018) than the incumbents. As a disruptive innovation, FinTech comes up with innovative alternatives in terms of product and services (Au & Kauffman, 2008; Zavolokina et al., 2016; Gomber et al., 2018) and increase competition in the financial industry (Goldstein et al., 2019).

Disruptive innovation has its issues such as stability, sustainability (Leong et al., 2017) and security (Gomber et al., 2018). However, disruptive innovation has the potential for the welfare of consumers and regulators, supervisors, and the financial service industry in terms of reputation (Anagnostopoulos, 2018).

Based on Clayton Christensen's disruptive-innovation model, catalytic innovations challenge organizations by offering simpler, good-enough solutions aimed at un-served groups. Catalytic innovation shares the same traits as disruptive innovation but focuses more on social change. Catalytic innovation can be defined as the phenomenon of using technology or innovation, in general, to improve the life of people and have a social impact (Christensen, Baumann, Ruggles, & Sadtler, 2006; Gabor & Brooks, 2017).

Industry convergence means new connections evolving between formerly unrelated industries in terms of technology areas, businesses, work processes, supply chains, and even the entire industry sectors as a whole. This connection generates innovation and can cause significant disruption. Industry convergence occurs as technologies, businesses, processes, and industries merge into each other till they are one. FinTech applies new technologies to develop innovative products or services that serve as the solution for the consumers of the financial industry (Gomber et al., 2017; Milian, et al., 2019).

This industry convergence led to the splitting of market share and the profits of the converged industries, in this case, this is the IT and finance industry. From the perspective of FinTech, it is assumed and understandable that the companies in IT and finance should work in collaboration as working solely will not bring any benefit to each (Au & Kauffman, 2008).

2.4. FinTech business models

Lending seems to be the most popular form of the FinTech business model (Jagtiani & Lemieux, 2018; Shim & Shin, 2016). The data is collected and the system calculates the credit scoring automatically

(Gomber et al., 2018). As mentioned earlier too, FinTech gives ownership to the consumers in terms of solutions for payments services (Leong et al., 2017), i.e., payments based on blockchain's technology (Goldstein et al., 2019), customer interaction, i.e., personal financial management, for funding, i.e., P2P funding or crowdsourcing (Leong et al., 2017; Lee & Shin, 2018; Shim & Shin, 2016; Goldstein et al., 2019) and insurance, i.e., usage-based insurance (Alt et al., 2018; Milia et al., 2019; Shim & Shin, 2016). In addition to this FinTech has come up with robo-advisors that use algorithms and suggest a mix of assets based on customers' characteristics and preferences (Lee & Shin, 2018). Another important model is the capital market business model which lets consumers handle their portfolios by themselves and allows them to do trading of foreign currency exchange (Leong et al., 2017; Lee & Shin, 2018), stocks and derivatives. Moreover, FinTech uses big data analytics to analyze the risk and behaviour and then offer customized and best possible solutions to its clients (Lee & Shin, 2018).

Another aspect of payment is via mobile devices known as mobile payment or m-payments (Au & Kauffman, 2008); this helps to make the payment without disclosing the credit card details (Thakor, 2020). Moreover, FinTech uses the application programming interface (API) for verification purposes. Last but not least, banks have come up with cybercurrency (Gomber et al., 2017).

2.5. Benefits and challenges of FinTech

Due to the factors of innovation, convenience and less cost, FinTech is getting popular at a fast rate (Goldstein et al., 2019; Leong et al., 2017; Milian et al., 2019; Lee & Shin, 2018). Thus, low cost leads to higher profitability (Gomber et al., 2018). One another reason behind this popularity is the lack of trust in the incumbent (banks) (Leong et al., 2017). Therefore, transparency is identified as one important key to the success of FinTech (Gomber et al., 2018). Also, FinTech has eliminated intermediation for example, in crowdfunding the lenders and borrowers can meet more directly on different electronic platforms with very small service charges as compared to banks (Au & Kauffman, 2008). Services by FinTech are cheap due to fewer regulations in this industry (Au & Kauffman, 2008).

Over time the competition is getting intense between FinTech and the incumbents as the incumbents have started in-house research and are transforming their offerings (Alt et al., 2018; Goldstein et al., 2019; Leong et al., 2017). FinTech is risky due to a lack of collateral (Lee & Shin, 2018; Gomber et al., 2017; Anagnostopoulos, 2018; Goldstein et al., 2019; Leong et al., 2017) as their target audience is very risky (Jagtiani & Lemieux, 2018) and FinTech lacks financial data required to measure credit risk correctly (Leong et al., 2017).

The solutions offered by FinTech like cryptocurrency are accused of feeding illegal transactions (Goldstein et al., 2019). Also, there is a high-security risk as all the data is stored in the cloud and just one glitch in technology can cause havoc (Thakor, 2020; Ozili, 2018; Lee & Shin, 2018; Goldstein et al., 2019). People still do not trust robo-advisors for investments as they lack human touch (Lee & Shin, 2018). FinTech is increasing its digital footprint (Gabor & Brooks, 2017). Lastly, coding used in blockchain or cryptocurrency is opaque and lacks transparency (Thakor, 2020).

2.6. Summary of the literature review

In this review of the literature, the authors have summarised the main insights from the most cited publications concerning FinTech and FinTech ecosystem. The originality of this review of the literature is that such a summary has never been done before and the authors propose the new concept of FinTech with the focus on categorizing FinTech as an IT company.

The list of the sources that have been selected for this research has never been analysed in the way the authors have reviewed. The SLR, QCA and frequency analysis methods were used to do the above-mentioned analyses.

3. RESEARCH METHODOLOGY

In this research paper, the authors have conducted a SLR to summarize the main sources of literature for each of the mentioned research questions. The SLR was followed by QCA and frequency analysis.

The authors did a SLR based on a sample of 22 research papers. These papers were shortlisted from 80 papers initially chosen from Google Scholar, Web of Science and Scopus. The criteria on which the papers were shortlisted were the number of citations in Google Scholar and Scopus and the impact factor of the journals in Scopus. Moreover, to summarize the literature and answer each research question authors conducted the QCA. As FinTech is an emerging industry and most of the academic work is done in the last decade, the authors chose the most recent papers, i.e., from 2017 to 2020 except for one paper which was cited by many researchers.

According to Okoli and Schabram (2010), the SLR is a systematic, explicit, comprehensive and reproducible method used to identify, evaluate, and synthesize the existing literature produced by researchers, scholars, and practitioners. The process of conducting the SLR has three major stages: planning the review, conducting the review and reporting the review. Planning the review includes two steps: formulating the review and developing and validating the review protocol. Planning the review is followed by conducting the review which has five steps: searching the literature, screening for inclusion, assessing the quality, extracting data and analyzing and synthesizing the data. Lastly, conducting is followed by reporting the review, which reports the findings (Xiao & Watson, 2019).

QCA is a research method for making relevant conclusions from data in the context, to provide understanding, new insights and interpretation of facts with a practical implementation guide. The aim is to achieve a consolidated and broad picture of the phenomenon. Generally, the purpose of the concepts or categories in QCA is to develop a model, conceptual map, conceptual system, or categories. There are two ways of conducting QCA: inductive and deductive way. Inductive is used when there is

not enough former knowledge in the respective area. However, deductive content analysis is used when the new analysis is done based on earlier knowledge or when the purpose is theory testing (Elo & Kyngäs, 2008).

For the interpretation of the results, the authors have used the inductive method. There were three steps. Firstly, the authors chose the fragments from the search papers which answered the five research questions. Following it, the authors chose the keywords from each segment that answered the research questions and were named or identified as the codes. Furthermore, after coding authors grouped codes into categories that have similar meanings or qualify to have similar characteristics.

Secondly, the frequency analysis was done for the identified categories. The frequency represented the number of authors who identified the codes in their papers. This frequency analysis was presented using different types of graphs.

Thirdly, analysis and conclusions were done based on the outcomes of the frequency analysis which was followed by the discussion and recommendations for future possible research.

4. RESULTS

4.1. What is FinTech?

FinTech is said to replace one of the most stable industries, which was stable over decades, the banking industry due to automation and digitization (Alt et al., 2018). Furthermore, FinTech is subcategorized as FinTech, RegTech and InsurTech (Zavolokina et al., 2016). The main goal of RegTech is automation in the standard regulatory and compliance processes (Gomber et al., 2018).

Table 1 shows the attributes of FinTech identified by different researchers in academic papers. The FinTech attributes were identified by coding using qualitative content analysis. As per the QCA, FinTech's attributes identified by the authors are service providers using communication internet, automated processes, innovative technology, highly efficient company, company with cost reduction, flexible, transparent, financial technology, new innovative products, customer-oriented, higher level of personalization, business process improvement. Disintermediation, disruptors, more secure, attract philanthropic investors and automation. The second column of the table shows the number of researchers who identified these attributes in used research papers. These attributes were identified as the codes in QCA. The last column identifies the authors who mentioned the specified attributes in their papers.

FinTech startups are IT-based companies that are offering innovative solutions to the financial industry. As a result, the financial industry is reshaping due to cost-cutting and improved financial products and services.

Therefore, based on the SLR, authors are proposing a definition of FinTech and answering *RQ1*. The definition is the following:

FinTech is an IT-based company that acts as a disruptor in the financial ecosystem. It provides financial services in parallel to traditional financial institutions such as banks and insurance companies. The main attributes of FinTech are the innovative technology and new and customized products which are customer-oriented and are highly efficient, transparent and flexible. These factors lead to high efficiency, cost reduction, flexibility, and automation.

Table 1. Attributes of FinTech

FinTech attributes	*Frequency of researchers*	*References*
Services offered using communication, internet and automated processes	6	Milian et al. (2019), Alt et al. (2018), Gomber et al. (2017), Ozili (2018), Puschmann (2017), Thakor (2020)
Innovative technology	11	Milian et al. (2019), Zavolokina et al. (2016), Goldstein et al. (2019), Anagnostopoulos (2018), Gomber et al. (2018), Gabor and Brooks (2017), Ozili (2018), Puschmann (2017), Lee and Shin (2018), Alt et al. (2018), Gomber et al. (2017)
High efficiency	3	Zavolokina et al. (2016), Lee and Shin (2018), Gomber et al. (2017)
Cost reduction	3	Zavolokina et al. (2016), Lee and Shin (2018), Thakor (2020)
Flexible	4	Zavolokina et al. (2016), Anagnostopoulos (2018), Gomber et al. (2018), Gomber et al. (2017)
Transparent	3	Alt et al. (2018), Gomber et al. (2017), Anagnostopoulos (2018)
Financial technology	1	Milian et al. (2019)
Comes up with new products	9	Milian et al. (2019), Zavolokina et al. (2016), Gomber et al. (2018), Alt et al. (2018), Lee and Shin (2018), Gomber et al. (2018), Ozili (2018), Puschmann (2017), Thakor (2020)
Extending customer access/customer-oriented	5	Gomber et al. (2018), Alt et al. (2018), Ozili (2018), Thakor (2020), Puschmann (2017)
Higher level of personalization	4	Gomber et al. (2018), Alt et al. (2018), Lee and Shin (2018)
Business process improvement	3	Zavolokina et al. (2016), Lee and Shin (2018), Thakor (2020)
Disintermediation	2	Lee and Shin (2018), Thakor (2020)
Disruptors	6	Zavolokina et al. (2016), Lee and Shin (2018), Alt et al. (2018), Gomber et al. (2017)
Security	1	Gomber et al. (2017)
Attract philanthropic investors	2	Gomber et al. (2018), Gabor and Brooks (2017)
Automation	2	Milian et al. (2019)

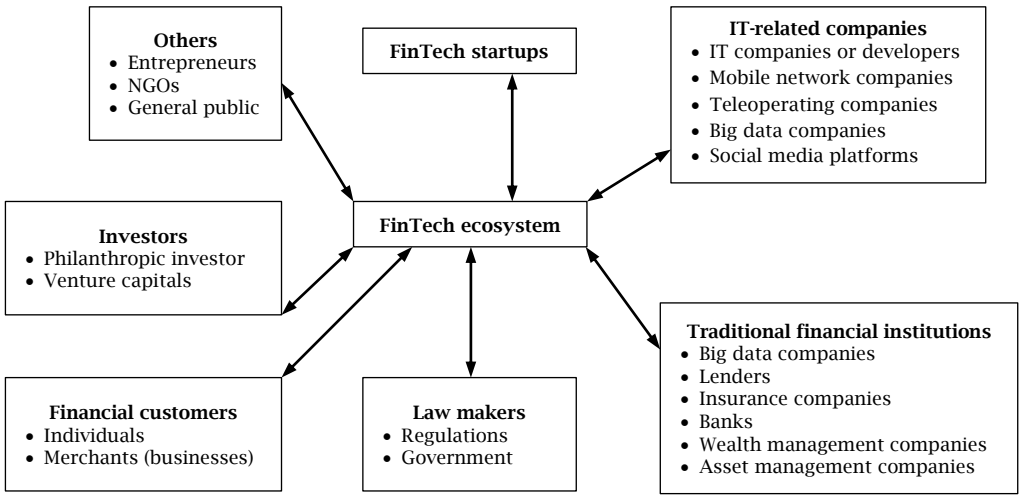
Source: Authors' elaboration based on the QCA.

4.2. FinTech stakeholders and ecosystem

To identify the main stakeholders and to get the overall essence of the FinTech ecosystem, the authors conducted the QCA and chose the fragments from 22 research papers that identified different stakeholders or in other words answered the second research question. This was done via coding (QCA), and then the authors categorized these codes into broader categories according to their characteristics of these codes.

The categories were IT-related companies, traditional financial institutions, lawmakers, financial customers, investors, FinTech startups and others. IT-related companies include IT companies or developers mobile network companies, teleoperation companies, big data companies, social media platforms, and teleoperating companies. The traditional financial institutions which are already providing financial services to the customers in the financial industry include big data companies, lenders, insurance companies, banks, wealth management companies and asset management companies. Lawmakers include the regulators and government. Moreover, financial customers include both the individual and the merchant (businesses). FinTech also includes investors which include venture capitalists and philanthropic investors. Lastly, other stakeholders in the FinTech ecosystem include entrepreneurs, non-profit organization (NGOs) and the general public. This is summarized in Figure 1.

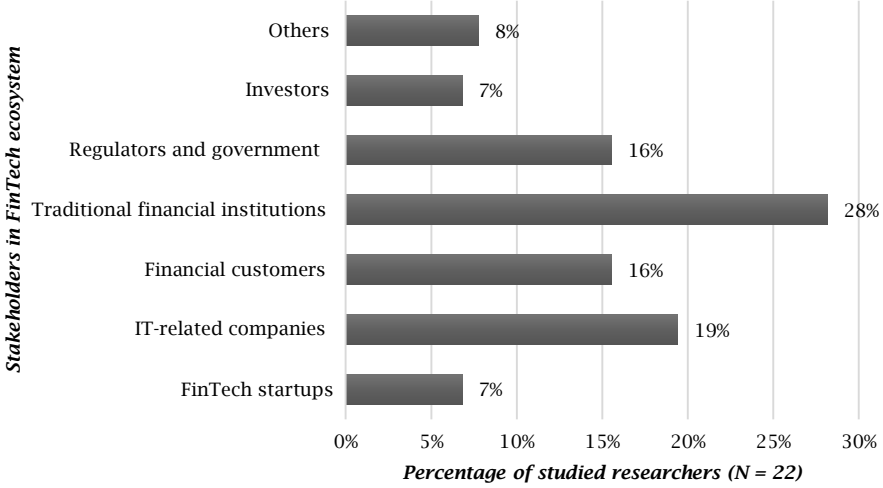
Figure 1. FinTech ecosystem based on the QCA



Source: Authors' elaboration.

In addition to the QCA, the authors conducted a frequency analysis of how other researchers identified the categories. The summary in Figure 2 shows the result in percentage. This percentage is the number of the researchers who identified these components divided by 22. According to the results, the main stakeholders in the FinTech ecosystem are the traditional financial institutions, IT-related companies, financial customers and regulators and government as identified by 28%, 19%, 16% and 16% researchers, respectively.

Figure 2. Components of the FinTech ecosystem



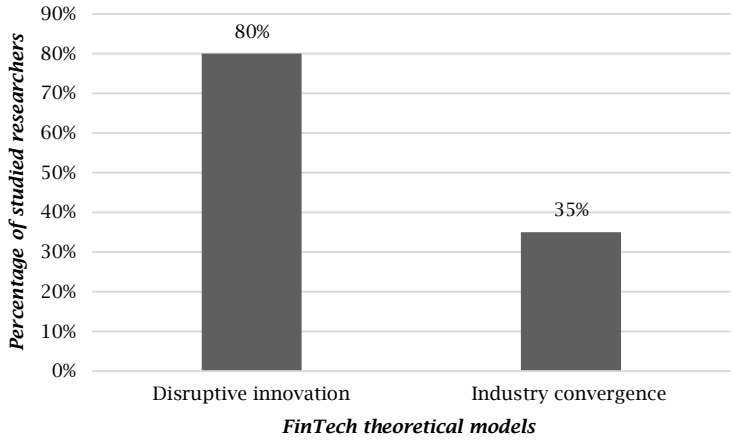
Based on QCA authors concluded a definition of FinTech ecosystem as follows which is the answer to *RQ2*:

FinTech ecosystem is the network of different stakeholders such as IT companies, traditional financial institutions (incumbents), lawmakers (government and regulators), investors, media, NGOs, general public and FinTech startups. In the FinTech ecosystem, stakeholders interact and affect each other in a way that results in the creation of the digital future of financial services.

4.3. Is FinTech a disruptive innovation or industry convergence?

The authors gathered the data and analyzed how many researchers identified FinTech as the disruptive innovation and how many researchers identified FinTech as industry convergence. Results are shown in Figure 3 which shows that 80% of the researcher from the papers taken into consideration agreed that FinTech a disruptive innovation and 35% identified FinTech as industry convergence and there were 15% of the researcher identified FinTech as both.

Figure 3. Disruptive vs. industry convergence

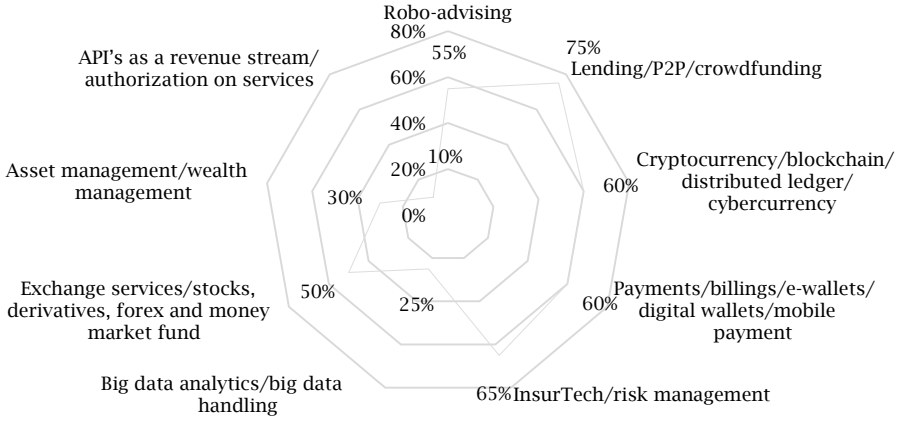


As per the findings, the authors answer *RQ3* and concluded that FinTech is more of a disruptive Innovation than industry convergence. Therefore, FinTech is an innovative product and service provider which have replaced or transformed expensive and highly sophisticated products and services.

4.4. FinTech business models

FinTechs offer businesses and individuals financial products and services using a full-stack business model. Full-stack startups refer to the startups which have full control over all aspects of the operations. This means that they have full control over production, distribution and support for their products. The authors identified the FinTech business models' value propositions identified by the researchers in 22 papers with the frequency of each of the identified models. The data collected is presented in terms of the radar chart in Figure 4.

Figure 4. FinTech business models



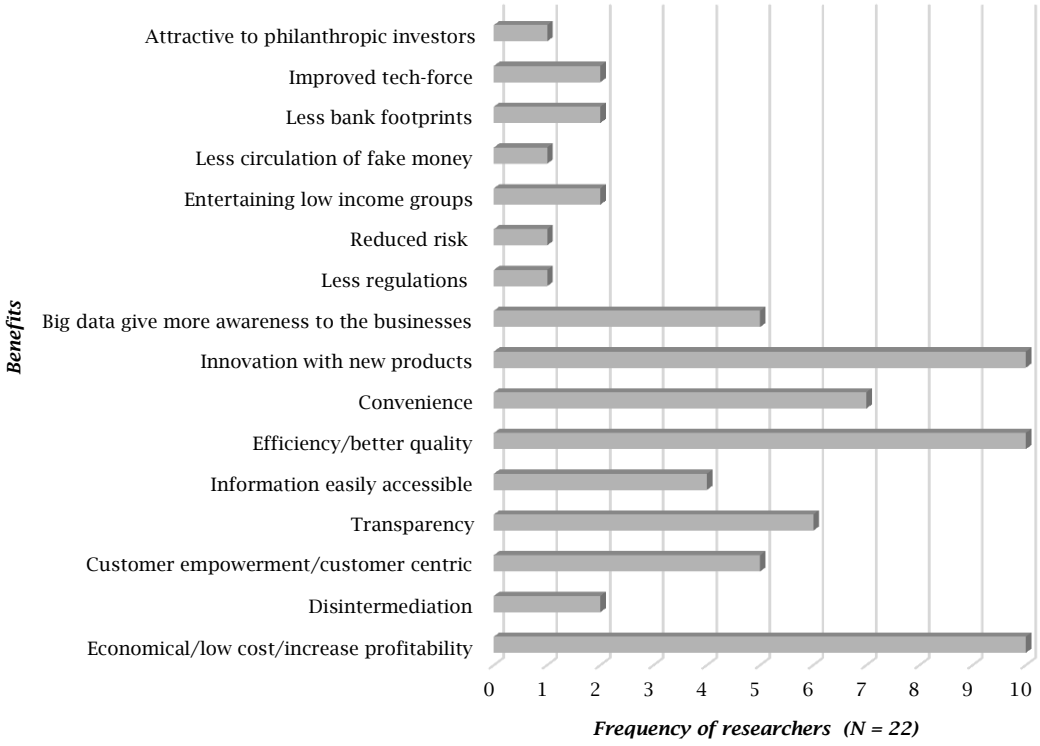
From the data, it was analyzed that the most famous FinTech business model among the researcher is lending (includes P2P lending, crowdfunding) as 75% of the researcher in the studied papers identified it, followed by insurance and risk management (InsurTech) 65%, followed by blockchain (cryptocurrency, distributed ledger and cybercurrency) 60%, followed by payments (e-wallets, mobile payments) 60% and exchange services (online platforms from trading) 50%. Other FinTech models identified were robo-advising 55%, APIs 20%, wealth management 30% and big data handling 25%.

Therefore, based on the QCA, the main FinTech business models identified are lending, risk management and the blockchain, thus, answering *RQ4*.

4.5. Benefits and challenges of FinTech

Along with cutting costs, it provides consistency and gives empowerment to the consumers (Zavolokina et al., 2016). Due to the mentioned factors, FinTech helps to improve the overall financial sector (Shim & Shin, 2016). FinTech has been good for the welfare of society as it served the underserved segment of the society, unlike the incumbent. For example, crowdfunding or mobile payments are good for individuals or firms who do not have a good credit score but need the funds or they need to make the payment without holding a bank account (Goldstein et al., 2019; Jagtiani & Lemieux, 2018). Moreover, as most of the services are online, FinTech is helping to reduce the carbon footprints of financial institutions (Gomber et al., 2018). Another benefit of FinTech is that they offer customized products (Lee & Shin, 2018; Anagnostopoulos, 2018). Lastly, it leads to the improvement of the knowledgeable workforce (Gomber et al., 2018). When the profitability increases it leads to better gross domestic product (GDP) for the country (Ozili, 2018). Lastly, the use of API has reduced the verification cost (Thakor, 2020). The summary of the benefits with the frequency of how many researchers identified them in the studied papers is shown in Figure 5.

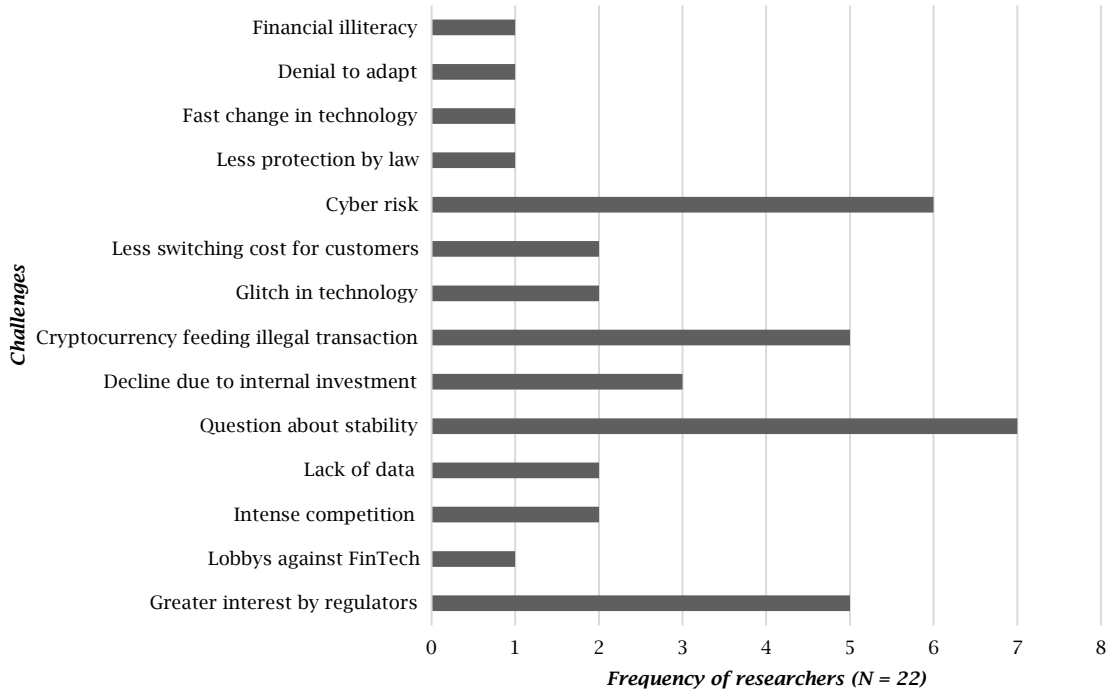
Figure 5. Benefits of the FinTech based on the QCA



On the other hand, Figure 6 shows the challenges faced by FinTech identified from the articles by the authors. The root of the biggest disadvantage lies in its biggest advantage, i.e., FinTech is getting popular as it does not have lots of regulations but now when businesses and individuals are keen on FinTech so now so are the regulators (Jagtiani & Lemieux, 2018; Anagnostopoulos, 2018; Milian et al., 2019). Thus, very soon the regulations for FinTech are expected.

Furthermore, when the cost is low, it reduces the switching cost (Alt et al., 2018; Gomber et al., 2018). On the contrary, there are industry-sponsored government lobbying groups that are resistant to the smooth diffusion and adoption (Au & Kauffman, 2008) or there can be groups who are resisted to use of technological solutions due to religious beliefs or superstitions (Gabor & Brooks, 2017; Ozili, 2018). These societies tend to have financial illiteracy and tend to follow religious teaching, as per which they are discouraged to adapt to technological changes in their environment.

Figure 6. Challenges of FinTech based on the QCA



In conclusion, the authors can conclude and answer *RQ5* that the biggest advantages as per the QCA and frequency analysis are the innovative products, efficiency, better quality and low-cost costs of the products and services leading to increased profitability. On the contrary, the biggest challenges faced by FinTech are the cyber risk, stability, suspicion about money laundering via cryptocurrency and the greater interest by the regulator. These disadvantages increase the vulnerability of FinTech producing deterioration in the interest of the investors.

5. DISCUSSION

With the SLR, the authors were able to answer the research questions identified at the beginning of this paper. These research questions will be answered one by one in the following paragraphs.

For the main research question (*RQ1*), the authors concluded a definition that says that FinTech is more an IT-based company than a traditional financial institution which have come up with new, innovative and tech-based solutions for financial customers. These services were initially offered by traditional financial institutions such as banks, insurance and so on. The products or services offered by FinTech are more customer-centric, customized, efficient, transparent and flexible. These attributes of FinTech lead to positive results for the users, for instance, cost reduction, high efficiency, flexibility and automation.

For *RQ2*, the main stakeholders in the FinTech ecosystem are grouped by the authors based on their characteristics and the role played by them. The main categories of the stakeholders identified in the FinTech ecosystem are as follows:

1. IT-related companies:
   - IT companies or the developers
   - Mobile network companies
   - Teleoperating companies
   - Big data companies
   - Social media platforms
2. Traditional financial institutions:
   - Big data companies
   - Lenders
   - Insurance companies
   - Banks
   - Wealth management companies
   - Asset management companies
3. Lawmakers:
   - Regulators
   - Government
4. Financial customers:
   - Individuals
   - Merchant (businesses)
5. Investors
   - Philanthropic investors:
   - Venture capitalists
6. Others:
   - Entrepreneurs
   - NGOs
   - General public

For *RQ3* about FinTech as the disruptive innovation or the industry innovation, it was found that most of the researchers in academia recognize FinTech as the disruptive innovation but some recognized FinTech as both disruptive innovation and industry convergence. Therefore, it can safely be said that FinTech is disturbing or giving the challenge to the incumbents, the traditional financial institutions.

For *RQ4*, the authors identified the major FinTech business models' value propositions that already exist in the market. FinTech played a major role in:

- credit industry via crowdfunding and P2P lending;
- risk management as InsurTech;
- payments and billing as e-wallets, digital wallets and mobile payments;
- cryptocurrency as cybercurrency, distributed ledger, cyber-currency and blockchain;
- financial securities as in exchange services, stocks, derivatives, forex and money market fund trading;
- big data handling as big data analytics;
- asset and wealth management as robo-advisors;
- authorization as the authorization on services through API.

For *RQ5*, FinTech is more competitive than other financial institutions in the financial industry. This is because FinTech came up with innovative and tech-based products which as a result led to the low cost and high profitability of its customers. These products improved the efficiency and quality in general. The main advantage of FinTech over traditional financial institutions is that it is customer-centric and flexible which gives empowerment to the customer and thus, satisfaction. In addition to this, FinTech benefits by providing transparency for, instance via blockchain. The customer now does not need to visit the banks or insurance companies as FinTech can with online solutions available 24/7 resulting in inconvenience and easily accessible information. FinTech does not only target wealthy customers but also low-income groups. Furthermore, FinTech helps businesses in terms of awareness through big data which helped them to understand the market and customer needs. Other things which bought a positive impact due to FinTech include improved tech force, disintermediation, fewer bank footprints, reduced risk and attraction to philanthropic investors and less circulation of fake money. Lastly, for time being, the FinTech industry has very less regulations as compared to the banking industry.

On the contrary, the main challenges faced by FinTech are the cyber risk and the glitch in technology as FinTech solutions are IT-based. Therefore, there is no backup if any mishap happens. There are several concerns regarding stability as big traditional financial institutions are now investing in technology in-house to avoid disruption which is threatening the growth of the FinTech industry. The biggest concern in the FinTech industry is the still ambiguous perception about cryptocurrency feeding money laundering. Another biggest concern is the greater interest by the regulators as the FinTech industry is growing exponentially. Other challenges include a lobby against FinTech, lack of data, intense competition, the less switching cost for the customers, less protection by law, fast-changing technology, denial to adapt by some groups of people and financial illiteracy.

Therefore, the authors concluded that FinTech is an IT company that is providing financial solutions and is a competitive threat to financial incumbents, such as banks. To be sustainable, banks and financial institutions need to embrace FinTech into their strategic model otherwise; it may impact the profitability and the client base negatively. Further research can be done to explore the best possible ways of adopting FinTech by the traditional financial institutions to find the challenges encountered by both parties in terms of regulations, the reaction by the customers, cost and profitability.

Also, the FinTech ecosystem gives an overall view of stakeholders which included the part of society that is underprivileged in terms of finances and literacy. Further research can be done to analyze and suggest ways to enhance FinTech's contributions to the building of a more financially inclusive society for the poor group too which is customer-centric in terms of the solutions and the costs structure.

Moreover, one of the biggest competitive advantages of the FinTech industry mentioned was the lack of regulation. So, further research can be done to assess opportunities, gaps and challenges for regulators to impose regulations on FinTech. Also, another research can be conducted for gap-filling in this regard, i.e., in terms of payments, blockchain, supply chain, fraud detection, safety policies and law enforcement. On the contrary, one of the challenges was a lack of adaptability due to religion, thus, further research can be done to study the implementation of FinTech in Islamic banking, for instance.

6. CONCLUSION

The word FinTech has been derived from the combination of finance and technology. As the name signifies this industry came into existence with the collaboration of the IT and finance industry. From the literature, it is clear that FinTech is an IT-based company coming up with innovative financial products where the traditional financial institutions had a drawback. These drawbacks were in terms of efficiency, cost and regulations. The innovative products provided by FinTech are customer-centric and customer friendly.

The FinTech ecosystem is the network where several stakeholders meet to where FinTech provides innovative solutions. FinTech ecosystem includes traditional financial institutions, consumers, regulators, NGOs, the general public, government, IT industry, media and investors. Some of the FinTech businesses identified were in the field of wealth management, lending, big data, insurance and exchanges. These stakeholders tend to impact FinTech either directly or indirectly.

FinTech is identified as a disruptive innovation leading to industry innovation. Most of the research papers studied was more in favour of disruptive innovation. The biggest benefit of FinTech is the decreased cost or increased profitability, innovative solutions, efficiency and convenience. On contrary, the biggest challenges faced by FinTech are cyber risk, future in terms of stability and sustainability, legality and the increasing interest of the regulators. However, less evidence was found to identify FinTech as the industry convergence.

There are some limitations of this research. Firstly, the number of research papers used is limited to 22. Secondly, FinTech itself is a very new topic in the world of academia and therefore, the research done on this topic is very limited. Lastly, the field of FinTech is in the transformation stage and hence, it is difficult to distinguish it as a financial or IT company.

This research has summarised previous literature to suggest a comprehensive definition of FinTech which makes it easy for the investors and

academicians to differentiate it from other financial institutions as it highlights all the attributes of FinTech identified earlier. Also, the FinTech ecosystem could help investors and banks who are willing to invest or who are affected by these new entrants (FinTech). This paper is beneficial for a researcher who is pursuing their research in the same field. Lastly, it may be useful for regulators who are trying to understand FinTech and its industry.

Some of the topics that could be used for further research are as follows. First, the integration of FinTech in the financial ecosystem. Secondly, what is the future of FinTech, i.e., if it will be the acquisition by the traditional financial institutions or will they play a separate role in the financial ecosystem. Thirdly, who will be regulating FinTech: the IT industry or the finance industry? Fourthly, what does the entrepreneurial FinTech model looks like? Fifthly, in which stage is FinTech from the perspective of the concerns-based adoption model (CBAM). Lastly, what are the social implications of FinTech?

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