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**FINANCIAL TECHNOLOGY OF THE MODERN AGE:
POLICY IMPLICATIONS AND NEW TRADE-OFFS**

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THESIS TITLE

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“At the end of the day, customer-centric fintech solutions are going to win.”

– “*Giles Sutherland, Carta Worldwide*”

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Abstract

The progression of financial know-how has headed to an uprising in providing monetary assistance as a result of the introduction of innovative solutions that simplify and improve financial procedures. This revolution was brought about as a direct result of the introduction of novel solutions as an upshot of the progress of financial technology. The advancement of technology, the shifting of the expectations of customers, and the introduction of new rules have all played a part in bringing this about. As a direct result of the capability of FinTech companies to provide customers with round-the-clock access to financial services, businesses have gained the ability to capitalize on new opportunities, which was a direct consequence of the ability of FinTech firms to provide customers with round-the-clock access to financial services. FinTech has also been responsible for the transformation of the sector by improving the overall quality of the customer experience and giving answers to the difficulties that are faced by traditional financial institutions. This has allowed FinTech to be a driving force behind the transition. Yet, regulatory bodies need to define and implement standards in order to safeguard the shelter of customers and to keep up with the advances in the FinTech industry. It is essential that this is done in order to guarantee that regulatory authorities are able to stay up with the rate of innovation. In general, the financial services industry stands to reap huge benefits from the application of FinTech; yet, in order for this development to be effective, it must both be sustainable and protected. The aim of this work is to describe the development of the Fintech landscape and the related regulatory challenges, with a specific focus on the European context.

Key Words

Financial Technology (FinTech), Policy Implications, Digital Banking, Disruption, Financial Inclusion, Payment Systems

List of Abbreviations

FinTech	: Financial Technology
RegTech	: Regulatory Technology
EBA	: European Banking Authority
ECB	: European Central Bank
P2P	: Peer-to-peer
GDP	: Gross Domestic Product
AI	: Artificial Intelligence
ML	: Machine Learning
PSD2	: The European Union's Second Payment Services Directive
CAGR	: Compound Annual Growth Rate
IFinTech	: International Financial Technology Market
AML	: Anti-money Laundering
KYC	: Know Your Customer
GDPR	: General Data Protection Regulation
CFT	: Counter-terrorism Financing
EU	: European Union
MAS	: The Monetary Authority of Singapore
FBI	: The Federal Bureau of Investigation
DDoS	: Distributed Denial of Service SFC
DoS	: Denial of Service
MITM	: Man-in-the-middle
PIN	: Personal Identification Number

NIS : The Network and Information Security

ENISA : European Union Agency for Cybersecurity

SFC : The Securities and Futures Commission

PBoC : The People's Bank of China

CFPB : Consumer Financial Protection Bureau

SEC : Securities and Exchange Commission

CFTC : Commodity Futures Trading Commission

FTC : The Federal Trade Commission

FCA : Financial Conduct Authority

MiFID : The Markets in Financial Instruments Directive

OCC : The Office of the Comptroller of the Currency

ASEAN : The Association of Southeast Asian Nations

Chapter – 1 Introduction

1.1 Introduction

The financial sector has been revolutionised by the rise of financial technology, sometimes known as FinTech. The advent of FinTech led to a dramatic improvement in the speed, ease, and convenience of monetary transactions. Increases in worldwide financial technology firms can be attributed to the popularity of mobile devices, online payment systems, and other digital platforms. FinTech businesses have challenged and disrupted traditional financial institutions and questioned the status quo. Mobile payment processing, crowdsourcing, financing, insurance, and asset management are just some services these businesses supply to their clientele.

Innovations in financial technology have altered the financial sector and introduced new regulatory considerations and trade-offs. Policy issues are associated with the need to regulate FinTech firms to safeguard consumers, reduce the possibility of fraud, and ensure the continued health of the financial system. However, governments must balance regulation and innovation in the financial technology industry to prevent stifling innovation. New costs and benefits are developing as traditional financial institutions adopt FinTech and the competitive landscape of the financial services sector shifts.

1.2 Research Objectives and Questions

This research aims to explore the new trade-offs and impacts that FinTech has on public policy. The rapidly growing FinTech industry in Europe, which has received much attention in recent years, will be the primary focus of this research. The aim is to compare and contrast the business practices and achievements of two of Europe's most prominent FinTech giants: Revolut and N26.

Research Question: 1

What policy consequences does FinTech have in Europe, and how can governments balance innovation and regulation?

Research Question: 2

What new trade-offs result from European financial institutions' acceptance of FinTech?

Research Question: 3

What are Revolut and N26's strategies and modes of operation, and how have they succeeded in the European FinTech market?

1.3 Significance of the Study

This study is limited to the European FinTech industry and, more significantly, to the top two companies, Revolut and N26. The rules, restrictions, and trade-offs associated with FinTech uptake in Europe will be analysed alongside the business models and strategies of Revolut and N26.

The fundamental reason for the significance of this study is its contribution to the current body of literature on FinTech, along with the policy implications and new trade-offs associated with implementing FinTech. The study's conclusions can benefit policymakers, regulators, established financial institutions, and FinTech startups in Europe and beyond.

1.4 Methodology

The approach used for this research is qualitative to explore the policy ramifications of FinTech in Europe. This methodology does not involve statistical analysis. The study began with a literature review, including scholarly articles, company reports, and government laws, to understand European FinTech policy and regulation.

Data analysis was conducted thematically, focusing on identifying recurring patterns and giving them meaning to conclude the issue. A case study comparing the plans and tactics of Revolut and N26 was also conducted to gain insight into how successful FinTech companies handle the particular challenges and opportunities of the industry.

The methodology entailed collecting data from extant sources, including “academic research papers, industry reports, government reports, and other pertinent publications.” The primary objective was to analyze and synthesize the available data to produce insights and conclusions about the current state of FinTech in Europe.

To accomplish this, the first step was to identify and gather relevant secondary data sources. This involved conducting a thorough literature review of academic journals, consulting

industry reports from reputable research firms, and analyzing existing government statistics and reports.

Once the data sources were identified and gathered, the researchers conducted a detailed data analysis to identify key themes and trends. Various statistical analysis tools and techniques, such as regression analysis, clustering, factor analysis, and other methods, were employed to identify patterns within the data.

The next step was to synthesize the analysis findings and draw conclusions about the current state of FinTech in Europe. This involved drawing inferences from the data and making judgments about the significance of the findings.

The study concludes by presenting its findings in a suitable format, which may include creating visual aids such as charts and graphs to communicate the main conclusions effectively. Hopefully, the research methodology employed in this study offered valuable insights into the policy implications and trade-offs of FinTech in Europe and the successful tactics adopted by FinTech companies.

Chapter – 2 Literature Review

2.1 Background of FinTech

"FinTech" has become increasingly popular as it refers to the intersection of finance and technology. The advent and emergence of FinTech have led to a revolution in financial services by introducing innovative solutions that streamline and enhance financial processes (Alam & Nazim, 2021). Technological progressions have had a significant impact on the financial services industry, causing a transformation in the way businesses and consumers interact with financial products and services. The expansion of FinTech can be credited to multiple factors, including advancements in technology, changing customer expectations, and shifts in regulations (Gomber, Kauffman, Parker, & Weber, 2018). With the widespread availability of mobile devices and the internet, FinTech companies have been able to offer consumers access to financial services at any time and from anywhere. This has opened up new opportunities for businesses to create solutions that meet their customers' requirements in a more convenient and accessible way. In addition to convenience, the upsurge of FinTech elucidations has also been driven by the need to improve the overall customer experience. Traditional financial institutions often struggle with outdated systems and long wait times, which can frustrate customers. FinTech companies, on the supplementary, have progressed solutions that prioritize customer satisfaction and offer faster, more efficient services (Nguyen, 2016). The financial sector has undergone a significant transformation due to the overall growth of FinTech. As technology progresses and customer expectations evolve, FinTech is expected to play a significant role in shaping the future of finance (Leong & Sung, 2018).

FinTech establishments have transformed financial services diligence by leveraging big data and analytics to offer customers more personalized and targeted facilities and services. This has led to a customer-centric approach that consumers will receive. However, this is just one example of how FinTech has transformed the industry (Branzoli & Supino, 2020). In addition to improving customer experience, FinTech companies have also addressed some of the challenges traditional financial institutions face. Traditional banks are notorious for lengthy processes, which can frustrate customers. FinTech solutions, on the other hand, have been designed to be more efficient and effective, addressing this challenge.

FinTech companies have also leveraged big data and analytics to provide customers personalized and targeted services (Arner, Barberis, & Buckley, 2015). Furthermore, FinTech

has also introduced new business models that have disrupted traditional financial institutions. FinTech startups have operated with lower overhead costs, enabling them to offer services at a lower price point than their traditional counterparts. This has forced traditional institutions to adapt and evolve to remain competitive.

A critical study by (Puschmann, 2017) discusses that FinTech has revolutionized the financial services industry, providing new opportunities for consumers and businesses. The amalgamation of finance and technology has empowered FinTech companies to develop innovative solutions that address the challenges confronted by traditional financial institutions. FinTech has the potential to carry out substantial benefits for the financial sector, and it is up to the supervisory bodies to ensure that this growth is sustainable and secure.

Many governments have also invested in FinTech initiatives to help stimulate economic growth and promote financial inclusion (Saksonova & Kuzmina-Merlino, 2017).

While FinTech has brought numerous benefits to the financial services industry, it has also brought about some challenges. One of the significant challenges is the need for regulation and compliance. Due to the fast-paced nature of FinTech, regulatory frameworks have not kept up with the advancements. This has resulted in a regulatory gap, potentially leading to consumer harm. Hence, there is a need for regulatory bodies to develop and implement guidelines that will ensure the safety and security of consumers (Makina, 2019).

FinTech companies must navigate a complex regulatory environment that is often subject to change, and they must also be able to address issues such as cyber security and data privacy (Naz, Karim, Houcine, & Naeem, 2022a).

Also, the growth of FinTech is set to continue, driven by the increasing demand for innovative and convenient financial services (Naz, Karim, Houcine, & Naeem, 2022b). In support of this, Rabbani (2022) The argument is that the evolution of FinTech is expected to pave the way for the emergence of innovative technologies and business models that will significantly impact the financial services industry. These changes are anticipated to be both exciting and unexpected.

2.2 FinTech Development in the last 5 years

FinTech has been experiencing rapid growth in the past five years, thanks to the increasing adoption of digital technologies in the financial sector. Due to the COVID-19 outbreak, there

has been an upsurge in the usage of digital payments, remote banking, and online transactions, as both consumers and businesses have shifted towards these digital alternatives (Martinčević, Črnjević & Klopotan, 2020). This has created an opportunity for FinTech companies to innovate and offer new solutions that meet the market's changing needs (Anielak, 2019).

In the previous few years, there has been an enormous growth in the use of mobile banking and digital wallets (Ferrari, 2022b). Consumers can now easily make payments, transfer funds, and manage their accounts using smartphones (Nicholls, 2019a). Furthermore (Anielak, 2019) describe that FinTech companies have also introduced new technologies like “blockchain, artificial intelligence (AI), distributed system and machine learning (ML)” to develop the efficiency and security of financial transactions.

Recently, the lending industry has undergone a remarkable transformation with the emergence of peer-to-peer lending platforms. These platforms enable individuals to lend and borrow money directly from each other, bypassing the need for traditional financial institutions. (Naz et al., 2022a). This has expanded the likelihood that small and medium-sized businesses will be able to secure financing.

Another significant development is in Robo-advisory (Pradhan & Wang, 2020), which offers automated investment advice and portfolio management using algorithms and artificial intelligence. As a result, investment guidance and support have become more affordable and accessible to a broader range of consumers.

Furthermore, the regulatory landscape for FinTech has been evolving rapidly, with many countries introducing new regulations to promote innovation and protect consumers (Branzoli & Supino, 2020). “An instance of this is in Europe, where the Payment Services Directive 2 (PSD2) has established equal opportunities for traditional financial institutions and FinTech companies. This directive mandates banks to share customer data with approved third-party providers” (Leong & Sung, 2018).

Figure - 2.1: Growth of FinTech



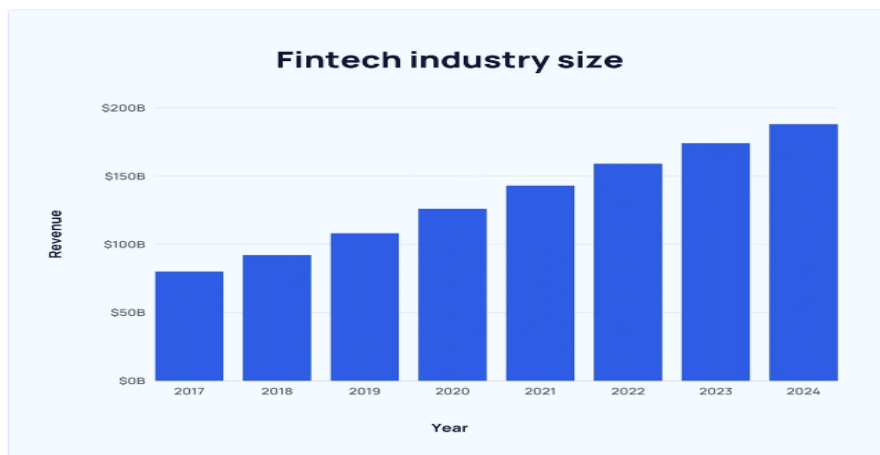
Source: Fact. Mr report March 2023

Hence, the past five years have seen significant growth and innovation in the FinTech industry, and that development is anticipated to remain in the future (Cull, 2022). FinTech companies will continue to drive novelty and disrupt traditional financial institutions, creating new opportunities and challenges for the financial sector (Boustani, 2020).

FinTech development has revolutionized the financial industry in Europe over the last five years. It has also provided access to financial services for individuals and industries previously underserved or excepted, as discussed by (Shashkova, Agranovskaya, & Kitsmarishvili, 2020). FinTech has made it easier to manage finances, make payments, invest, and access credit. This has increased financial inclusion, lower costs, and greater customer convenience (Choi, Kaul, & Goodman, 2019). FinTech has also disrupted traditional banking models, increasing competition and innovation. The rise of FinTech has prompted traditional banks to incorporate digital strategies to remain competitive (Anand & Mantrala, 2019). In addition, governments and regulators are recognizing the importance of FinTech and are taking steps to promote its growth and ensure its safety and stability. Overall, the progress of FinTech in the modern age has a significant effect on the economy in Europe and is estimated to continue to grow and evolve in the years to come (Omarova, 2020).

Figure - 2.2: FinTech Industry Size

In 2017, global Fintech industry revenue was approximately \$90.5 billion. That figure has grown by over 100% since then.



Here is a full breakdown of fintech industry revenue (converted from Euros)

Source: Vantage Market Research

2.3 FinTech Innovations in Financial Services

Numerous research papers have been conducted on the advancements in financial technology within the European financial sector over the past four years. Referring to a report by KPMG, total expenditures in European FinTech companies reached €36.6 billion in 2019 (Frost, 2020). Another European Banking Authority (EBA) study revealed that 80% of European banks had initiated FinTech-related activities, focusing on digital payments, lending, and personal finance management (Kapsis, 2020a).

In addition, according to a report from McKinsey & Company, retail banking revenues in Europe are predicted to be up to 60% from FinTech by 2025. The same study also highlighted that FinTech companies are transforming lending institutions by providing innovative solutions such as mobile payments and support, robo-advisory services, and peer-to-peer lending (Wewege, Lee, & Thomsett, 2020).

Additionally, (Nabilou, 2020) states that the European Central Bank (ECB) has been aggressively encouraging the progress of FinTech in Europe through countless initiatives, such as the Euro system's FinTech Forum, which aims to foster dialogue between the ECB and the FinTech industry. The collective findings of these studies suggest that FinTech has

emerged as a significant player within the European financial services sector, and it is anticipated to fuel further expansion and advancement in the upcoming years.

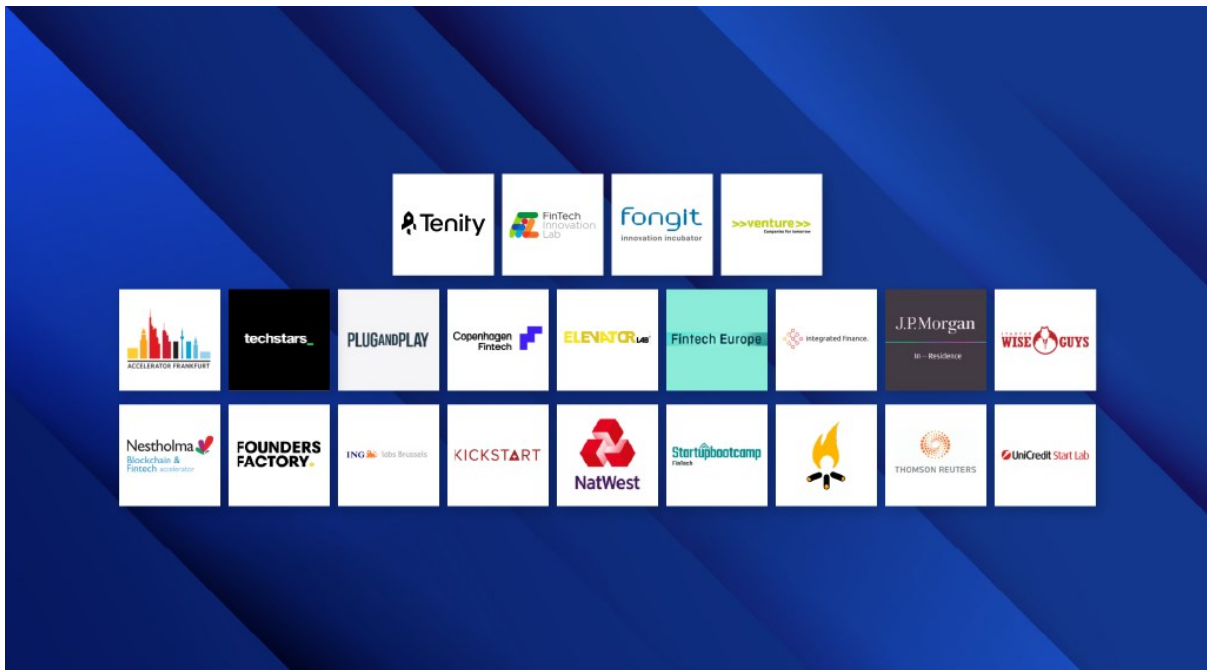
The FinTech industry has speedily advanced in the past few years and has substantially impacted financial services in Europe. Also, another exciting study site is that FinTech innovations such as digital payments, online lending, blockchain technology, and robo-advisory services have changed the way traditional financial institutions operate (Sood & Singh, 2022).

Further again (Sood & Singh, 2022) state that these innovations have increased competition in the financial industry, lowering consumer costs and increasing accessibility to financial services for underserved populations. Additionally, FinTech has improved the speed and efficiency of financial transactions, making it easier for businesses to conduct cross-border transactions.

However, the rise of FinTech has also created challenges for traditional financial institutions, including regulatory compliance and the need to adapt to changing consumer behaviour. Despite these challenges, FinTech innovations have created opportunities for collaboration between established banks and innovative FinTech companies.

(Nuyens, 2019) As a result of FinTech's innovations, a new financial services environment has emerged. As the FinTech industry continues to grow and develop, it will be imperative for financial institutions to adapt and innovate to remain competitive and provide the best possible services for consumers.

Figure - 2.3: FinTech Technology



Source: <https://explodingtopics.com/blog/FinTech-stats>

2.4 FinTech and Financial Inclusion

"Financial Enclosure" refers to making mainstream financial services available to people and places that would otherwise be shut out. In many developing countries, access to financial services is limited, and many people lack admittance to elementary financial services such as savings accounts, credit, and insurance (Wewege, Lee, Thomsett, & Banking, 2020; Yahya, 2021). This is where FinTech comes in. FinTech companies have played a vital role in enhancing financial inclusion by leveraging know-how to create innovative explanations that meet the needs of underserved populations.

One of how FinTech has contributed to financial inclusion is through mobile payments. Mobile payments have enabled individuals to send and receive money using their mobile phones, which is particularly important in countries lacking traditional banking infrastructure (Guild, 2017). Furthermore (Makina, 2019) describe that this has enabled individuals to access financial services without a traditional bank account, which can be challenging to obtain in many developing countries. Mobile payments have also facilitated the growth of e-commerce, allowing individuals to buy and sell goods and services online.

FinTech has played a significant role in enhancing financial inclusion by facilitating microfinance. Microfinance organizations offer modest loans to individuals who lack access to conventional banking facilities (Banna, Mia, Nourani, & Yarovaya, 2022). FinTech has collaborated with microfinance institutions to establish digital lending platforms that simplify the loan application process for individuals. These platforms employ unconventional data sources, such as mobile phone usage and social media activity, to evaluate creditworthiness, thereby simplifying the process of obtaining loans (Priyan, Nyabakora, & Rwezimula, 2023).

FinTech has also empowered the progress of peer-to-peer lending platforms, which connect borrowers directly with lenders. These platforms are particularly successful in countries with limited traditional banking services (Najaf, Subramaniam, & Atayah, 2022). These platforms enable individuals to borrow money from others, often at a lower interest rate than traditional lenders. P2P lending platforms have also facilitated crowdfunding growth, allowing individuals to raise money for a specific project or cause.

In addition to expanding access to financial services (Breidbach & Ranjan, 2017) argue, FinTech has also helped to reduce the cost of financial services. Traditional financial institutions often have high fees, making it difficult for low-income individuals to access financial services (Ab Razak, Dali, Dhillon, & Manaf, 2020). FinTech companies have developed solutions that are often cheaper and more affordable than traditional financial services. For example, digital wallets and mobile payments are often cheaper than traditional bank transfers and remittances (Alladi, Chamola, Parizi, & Choo, 2019).

FinTech can enhance access to financial services for underprivileged groups, but it also brings about certain hurdles that must be tackled. One of the most significant obstacles is the digital divide, which denotes the gap between those with access to technology and those without access. Many developing nations still have sizable populations without access to mobile phones or the internet. Because of this, FinTech is unable to reach neglected communities.

Another challenge is the need for regulation and oversight. As FinTech continues to expand, there is a need for regulatory bodies to ensure that FinTech companies are operating safely and securely (Oseni & Ali, 2019). Ensuring protection from fraud and other forms of financial abuse is crucial for achieving financial inclusion through FinTech, particularly for individuals without access to financial services.

A study illustrated that financial inclusion is a critical global issue, especially in developing countries. FinTech has emerged as a game-changer in improving financial inclusion by providing innovative and low-cost solutions to the financially excluded population (P. J. Morgan, 2022). Several studies have been directed on the part of FinTech and its impact on financial inclusion from the year 2018 to 2023.

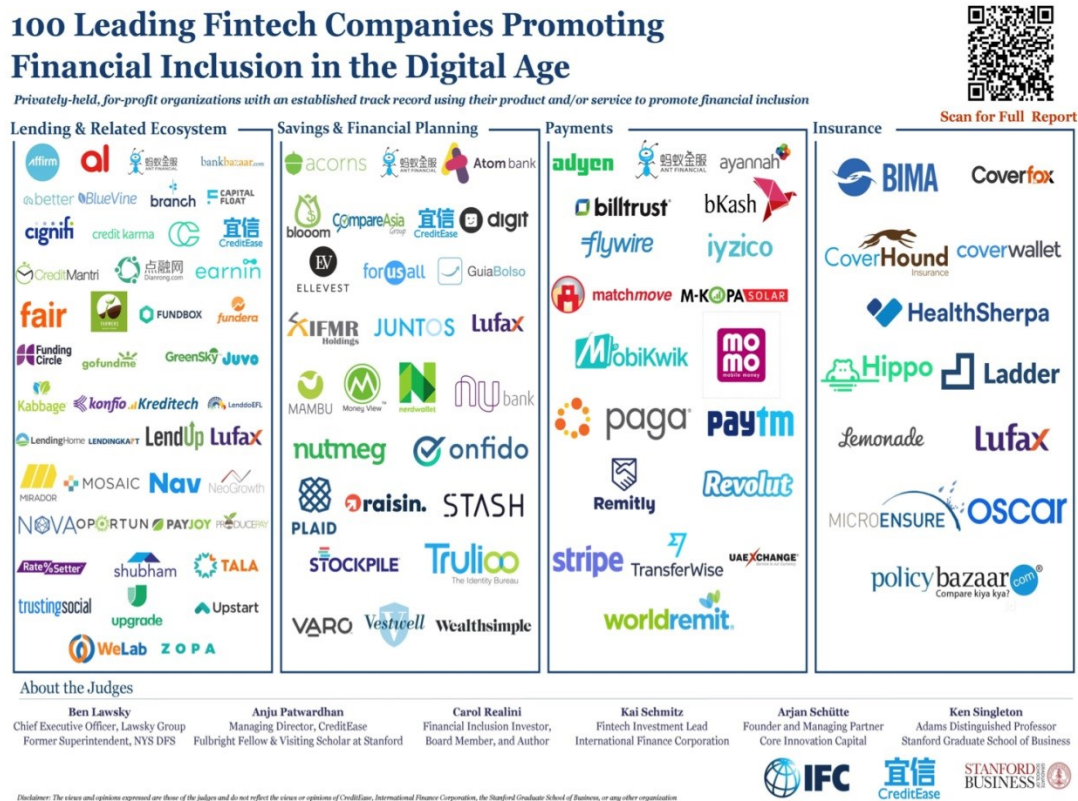
One of the studies conducted in 2018 by the World Bank Group found that FinTech will play a significant role in cumulative and growing financial inclusion (Arner, Buckley, Zetsche, & Veidt, 2020). The research found that FinTech companies could reach the financially excluded population by leveraging technology and innovative business models (Choi et al., 2019). As per a study conducted by the European Central Bank in 2019, FinTech has the potential to significantly enhance financial inclusion by broadening the availability of financial services to underprivileged and unbanked communities (Cull, 2022).

A report published by McKinsey & Company in 2020 highlighted that FinTech could potentially add \$250 billion to the GDP of emerging economies by improving financial inclusion. The report found that FinTech companies could provide financial services to many people who were previously excluded from the formal financial system. This has increased economic activity and improved living standards in these countries (Wewege, Lee, & Thomsett, 2020).

Another study conducted by the University of Edinburgh in 2021 found that FinTech has the potential to improve financial inclusion in developing countries meaningfully. The study found that FinTech companies could provide financial services at a lower cost and more efficiently than traditional financial institutions (Du, Zhou, Yang, & Du, 2022). This has resulted in augmented admittance to financial services and improved financial literacy among the financially excluded population.

In conclusion, FinTech has emerged as a game-changer in improving global financial inclusion. The studies conducted from 2018 to 2023 have highlighted the potential of FinTech to provide innovative and low-cost solutions to the financially excluded population. FinTech has the potential to significantly improve financial inclusion, resulting in increased economic activity and improved living standards in developing countries (Khurana, 2022).

Figure - 2.4: FinTech Companies and Financial Inclusion



Source: <https://www.practicaledge.com/charts-global-FinTech-investment-in-2021>

2.5 FinTech Business Models and Their Impact on the Financial Industry

(Tanda & Schena, 2019) In recent years, the financial industry has undergone a notable transformation in its operations, marked by a shift in the approach to conducting business. FinTech business models have emerged as disruptors to traditional financial services, offering new and innovative ways to access financial products and services.

In the past four years, numerous studies have investigated the influence of FinTech business models on the financial industry. One study found that FinTech start-ups have successfully disrupted the traditional banking industry by providing various digital services such as online lending, mobile payments, and online investments (Frost, 2020). Another study (P. J. Morgan, 2022) found that FinTech business models have also led to increased competition and innovation in the financial industry, resulting in lower fees and better consumer services.

Furthermore, the results of these studies show that FinTech business models have significant potential for growth as they continue to attract significant investment and gain market share. However, they also threaten traditional financial institutions that have slowly adapted to the changing landscape (Ali, Abdullah, & Zaini, 2019).

Regulatory and policy implications concerning the impact of FinTech business models on the financial industry have also been examined in various studies. One study found that regulatory authorities are struggling to keep up with the rapid pace of innovation in FinTech and that new policies and regulations need to be developed to ensure that FinTech companies operate safely and securely (Ferrari, 2022a).

Overall, the consequences of these studies recommend that FinTech business models have had a significant bearing on the financial industry, leading to increased competition and innovation. While these studies recognize the benefits of FinTech, they also emphasize the importance of meticulous supervision and regulation to mitigate potential risks to consumers and the financial system, thus maintaining a balance between the advantages and the potential drawbacks of FinTech. The methods used in FinTech business models are diverse and innovative, with a strong focus on leveraging technology to provide more efficient and cost-effective financial services (Choi et al., 2019). One standard method is using mobile apps and online platforms to facilitate peer-to-peer lending, crowdfunding, and other alternative forms of financing. These platforms allow individuals and small businesses to access capital more efficiently and at lower costs than traditional banks (Leong & Sung, 2018).

In FinTech business models, another approach is utilising artificial intelligence (AI) and machine learning to analyze vast data and make informed lending decisions. This helps to reduce the risk of default and improve the accuracy of credit scoring.

Blockchain technology is also used in FinTech business models to provide secure and transparent transactions. This has led to the emergence of cryptocurrencies, which are becoming increasingly popular for payment and investment (Leal, Teixeira, & Moreira, 2022).

Also (Leal et al., 2022) argue that the methods used in FinTech business models are characterized by their focus on innovation, efficiency, and customer-centricity. By leveraging the latest technology, FinTech institutions are disrupting the traditional financial industry and providing new and novel ways of accessing and managing financial services. Over the past few years, Europe has seen an enormous rise in FinTech innovation, development and growth

driven by a combination of factors, including supportive regulatory frameworks, access to funding, and growing consumer demand for more convenient and accessible financial services (Nicholls, 2019b).

One trend that has emerged is the growth of digital-only banks or Neobanks, which offer customers a range of services such as current accounts, payments, and lending, all through a mobile app or website. Neobanks have disrupted the conventional banking industry by offering more innovative and user-friendly services, often at a reduced cost. (Buchi, Cugno, Luca, Zerbetto, & Castagnoli, 2019).

The European FinTech industry is also witnessing a rise in the use of artificial intelligence (AI) and machine learning (ML) technologies. These technologies are being employed to improve customer experience, automate processes, and enhance risk management. For instance, AI-powered chatbots can assist customers with their queries and requests, while ML algorithms can analyze a large amount of data to identify and classify patterns and perceptions that can notify business decisions (Bradford, 2020).

To speed up innovation and break down regulatory barriers, regulatory sandboxes have emerged as a means for FinTech start-ups to experiment with their products and services in a structured financial environment. In another interesting study by Kapsis (2020a), the European FinTech landscape was found to have undergone significant transformation over the past five years, driven by innovation, regulatory support, and investor confidence. As the FinTech industry continues to evolve, new developments and emerging trends are likely to emerge in the years to come.

2.6 FinTech in Europe: New Developments, Challenges and Emerging Trends

The intensification of FinTech in Europe has been noteworthy in recent years. The industry has experienced significant growth, with FinTech start-ups attracting millions of dollars in investments (Tsanis & Stouraitis, 2022). According to a report by KPMG, in the first half of 2021, European FinTech raised a total of \$14.8 billion, a 35% increase from the same period in 2020 (Khurana, 2022).

Also, one of the major reasons noticed for the development of FinTech in Europe is the continent's regulatory environment (Ferrari, 2022a). The emergence of open banking, which permits third-party providers to access financial information and provide novel services to

customers, has been made possible by the European Union Payment Services Directive (Ferrari, 2022b).

Another factor contributing to the rise of FinTech in Europe is the high rate of smartphone adoption and digital literacy. Europeans are progressively exhausting mobile devices to have access to financial services, and FinTech companies have capitalized on this drift by developing user-friendly mobile apps that make banking more accessible and convenient, as discussed by (Baba et al., 2020).

The COVID-19 pandemic has further accelerated the adoption of FinTech solutions, as people were required to stay at home and traditional banking services were disrupted. FinTech companies, with their agile and innovative business models, were able to quickly respond to customers' varying requirements and offer new solutions such as contactless payments and online lending (Vasenska et al., 2021).

In addition, Europe's strong start-up culture and access to funding have also backed the progress of FinTech in the region (Vasenska et al., 2021). Many FinTech companies have emerged from Europe's vibrant start-up ecosystem, and the availability of venture capital and angel investors has allowed these companies to scale up and compete with established financial institutions (Abu Daqar, Constantinovits, Arqawi, & Daragmeh, 2021; Nicholls, 2019a).

The rise of FinTech in Europe can be endorsed by an amalgamation of various factors, including regulatory support, digital literacy, and access to funding (Nicholls, 2019a) as the industry continues to grow and mature. As FinTech continues to gain momentum, it is expected to play an increasingly important role in the financial sector, fundamentally changing the way people access and utilize financial services. (Arslanian, Fischer, Arslanian, & Fischer, 2019).

However, Europe also faces challenges in terms of regulatory fragmentation, with different countries having their own regulations and licensing requirements for FinTech companies. This can make it difficult for FinTech startups to operate across borders.

Other countries have also experienced rapid growth, driven by factors such as a large unbanked population, increasing smartphone penetration, and government support for innovation. One emerging trend globally is the use of mobile payments, which has become popular in countries such as China and India (P. Morgan, 2022).

However, other countries also face challenges, such as the lack of regulatory frameworks and the need for greater consumer protection. There is also competition from established players, such as banks and traditional financial institutions.

According to (Mansur, Samsuri, Nurhayati, & Khoyyilah, 2022), while both Europe and other nations have seen significant developments in FinTech, they face unique challenges and have different emerging trends. As FinTech continues to progress, it will be imperative for companies and governments to navigate these challenges and take advantage of the opportunities presented by emerging trends (Berg, Guadamillas, Natarajan, & Sarkar, 2020).

Chapter – 3 International Financial Technology Market (IFinTech) and Core Infrastructures

3.1 The FinTech Market

The financial technology (FinTech) market has exploded in popularity in recent years, completely changing the financial services sector with its cutting-edge innovations. Statista predicts that by 2025, the global FinTech industry will be worth \$460 billion; this growth in the financial sector is expected to continue at a compound annual growth rate (CAGR) of 23.8% from 2020 onwards, fueled by advancements in technology, evolving customer preferences, and supportive government policies (Aniqoh & business, 2020).

The FinTech market can be broadly divided into several categories, including payments, lending, personal finance, wealth management, and insurance. Each of these categories has experienced significant growth in recent years, with payments and lending being the largest segments (Giglio, 2021).

In another study (Aldaas, 2021), the payments segment has witnessed the most significant growth, with a projected market size of \$4.9 trillion by 2023, according to a report by Mordor Intelligence. The expansion of the payments sector can be attributed to the increasing use of mobile devices and the internet, which have enabled consumers to access financial services conveniently and at any time. Additionally, the growth has been further fueled by the popularity of mobile payment solutions like PayPal, Apple Pay, and Google Wallet (Wewege, Lee, Thomsett et al., 2020).

The lending segment has also experienced significant growth, with a projected market size of \$312 billion by 2023, according to a report by Markets and Markets. The progress of the lending division can be attributed to the cumulative demand for access to credit, particularly among underserved populations. FinTech companies have been able to leverage technology to provide faster and more convenient access to credit, particularly through peer-to-peer lending platforms (Najaf et al., 2022; Nguyen, 2016).

The personal finance segment has also witnessed significant growth, with a projected market size of \$1.5 trillion by 2023, according to a report by Research and Markets. The growth of the personal finance segment can be attributed to the growing demand for financial management tools that can help consumers manage their finances more effectively. FinTech

solutions such as budgeting apps and personal finance management platforms have been able to fill this gap (Atik, Dholakia, & Ozgun, 2023).

The wealth management segment has also experienced significant growth, with a projected market size of \$5.7 trillion by 2023, according to a report by Research and Markets. The growth of the wealth management segment can be attributed to the increasing demand for digital investment advice and portfolio management services. FinTech solutions such as robo-advisors have been able to provide investors with personalized investment advice at a lower cost than traditional wealth management firms (Abraham, Schmukler, & Tessada, 2019).

Finally, the insurance segment has also witnessed significant growth, with a projected market size of \$184 billion by 2023, according to a report by Markets and Markets. The growth of the insurance segment can be recognized by the escalating demand for innovative insurance products that can be customized to individual needs. FinTech companies have been able to leverage technology to provide consumers with personalized insurance products and services, such as pay-as-you-go insurance policies (Abraham et al., 2019).

In summary, the FinTech market has witnessed fiery growth in recent years, renovating the financial services industry by providing innovative solutions that have improved and streamlined financial services.

The FinTech market consumes mounted rapidly in recent years, and it is a truly global phenomenon. With the utilization of technology to create innovative products and services, FinTech start-ups are posing a significant challenge to the traditional financial services industry. The growth of FinTech has been driven by a range of factors, including evolving consumer behaviour, advancements in technology, and growing demand for digital services (Pollari, 2016).

At an international level, the FinTech market is dominated by a few key players, including the United States, China, and Europe (Frost, 2020). The United States is home to many of the largest FinTech companies in the world, such as PayPal, Stripe, and Square. The US has a strong regulatory environment for FinTech, with a number of regulatory bodies overseeing the industry.

China is also a major player in the global FinTech market, with companies such as Ant Financial (a subsidiary of Alibaba) and Tencent dominating the market as per (Xiang, Lina,

Yun, & Chengxuan, 2017) has been driven by the country's large and growing middle class, as well as its extensive use of mobile payments.

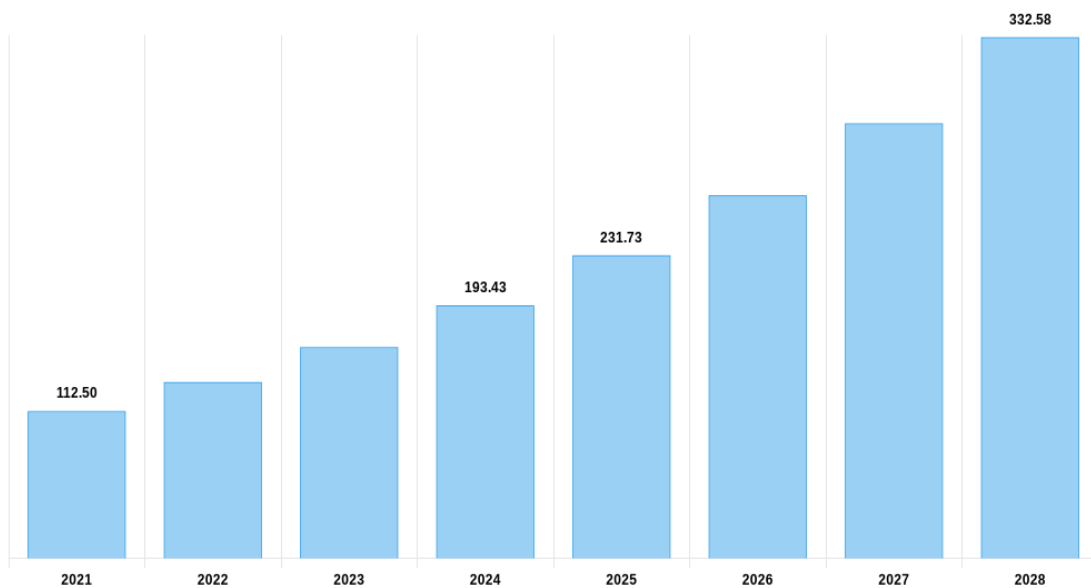
Europe is another important region for FinTech, with a number of innovative companies based in cities such as London, Berlin, and Stockholm. The European FinTech market is regulated by the European Union, which has created a single market for financial services across the region (Sohns, Wójcik, & Space, 2020).

At a global level, FinTech is anticipated to continue to grow rapidly in the coming years. The market is expected to be worth over \$300 billion by 2025, with Asia-Pacific and North America expected to be the largest regions for FinTech investment. In addition, FinTech is likely to continue to disrupt traditional financial services, with the potential to transform areas such as banking, insurance, and investment management (Varma, Boulton, & Brief, 2018).

Overall, the FinTech market is a dynamic and rapidly evolving industry that is changing the way that financial services are delivered around the world. With new innovations and technologies emerging all the time, the future of FinTech looks bright, and the industry is likely to continue to grow and transform in the coming years.

Figure - 3.1: FinTech Market

Fintech Market Size, 2021 To 2028 (USD Billion)



Source: <https://www.practicalecommerce.com/charts-global-FinTech-investment-in-2021>

3.2 Key FinTech Market Players in Europe

FinTech, the convergence of finance and technology, has been a rapidly growing industry, and Europe has been one of the key players in the universal FinTech market.

One of the leading FinTech companies in Europe is Revolut, which offers a range of digital banking services, including mobile payments, currency exchange, and international money transfers. Founded in 2015, Revolut has developed itself as among the quickest-expanding FinTech companies in Europe, with over 15 million customers across the region (Murinde, Rizopoulos, & Zachariadis, 2022). The company has raised over \$900 million in funding, and its valuation has reached \$33 billion as of 2021. Revolut has been able to attract customers with its innovative features, such as its multi-currency accounts and real-time spending notifications.

Another key player in the European FinTech market is Transfer Wise, which was founded in 2011 and offers a low-cost international money transfer service. Transfer Wise has disrupted the traditional banking sector with its transparent pricing and fast transfer times (Aihie, 2019). The company has over 10 million customers globally and has raised over \$1.2 billion in funding. Transfer Wise has also expanded its offerings to include a borderless account, which allows customers to hold and manage money in multiple currencies.

Adyen is another leading FinTech company in Europe that offers payment solutions for businesses of all sizes. Founded in 2006, Adyen has grown rapidly and now processes payments for companies such as Uber, Spotify, and eBay. Adyen's innovative payment technology allows businesses to accept payments from a wide range of payment methods and currencies. The company went public in 2018 and had a market capitalization of over \$70 billion as of 2021 (Martinčević, Črnjević, & Klopotan, 2020a).

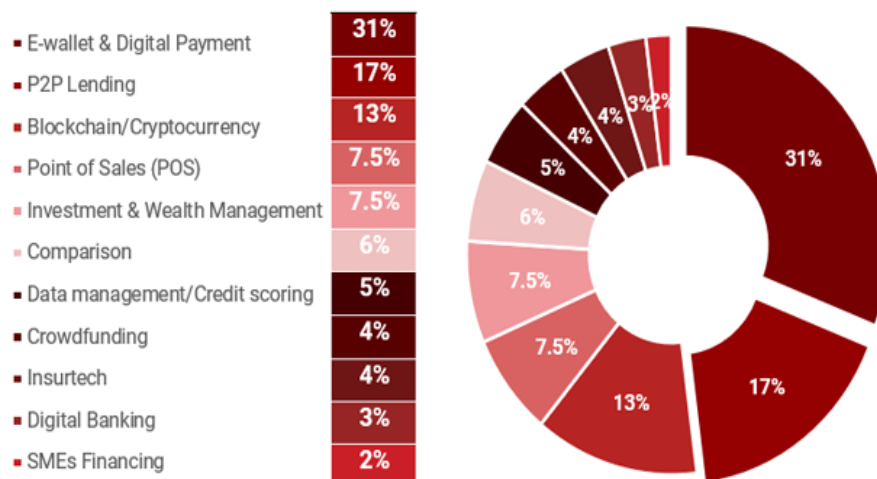
Klarna, a Swedish FinTech company founded in 2005, has become a leader in the “buy-now-pay-later space”. The company offers a range of payment solutions, including pay later and instalment plans, for online and in-store purchases. Klarna has over 90 million customers globally and has raised over \$3.7 billion in funding. The company's success can be attributed to its seamless checkout process and customer-friendly payment options (Muhammad, Pan, Magazzino, Luo, & Waqas, 2022).

Finally, N26 is a German FinTech company that offers mobile banking services. The company was founded in 2013 and has grown rapidly, with over 7 million customers across

Europe. N26 offers features such as mobile payments, savings accounts, and overdraft protection. The company has raised around \$800 million in funding and has an estimation of over \$3.5 billion as of the year 2021 (Fountis & Mukherjee, 2021; Schmidt-Jessa, 2022).

The European FinTech market has been a hotbed of innovation and growth, and the key players in the market have been leading the charge. Companies like Revolut, Transfer wise, Adyen, Klarna, and N26 have disrupted the traditional financial services industry and have attracted millions of customers with their innovative solutions (Martinčević et al., 2020a; Murinde et al., 2022). These companies have shown that there is a huge demand for digital financial services, and they are well-positioned to continue to grow and shape the future of the FinTech market in Europe and beyond.

Figure - 3.2: FinTech Trend in 2022



Source: <https://www.practicalecommerce.com/charts-global-FinTech-trends-q2-2022>

3.3 Challenges of FinTech Market Players

In one of the studies by (Saba, Kouser, & Chaudhry, 2019), the FinTech industry is rapidly growing and disrupting the traditional financial services sector. However, as FinTech market players continue to innovate and expand, they also face a range of challenges.

One of the biggest challenges for FinTech market players is regulatory compliance. FinTech companies are subject to a range of regulatory frameworks, including data protection, financial regulation, and consumer protection laws (Saba et al., 2019). As these companies expand internationally, they must navigate the different regulatory environments of each country they operate in. Compliance can be costly and time-consuming, and failure to comply can result in fines and reputational damage.

Another challenge for FinTech market players is cyber security. As FinTech companies handle large amounts of sensitive financial and personal data, they are a prime target for cybercriminals (Románova & Kudinska, 2016). Cyber-attacks can result in financial damage and losses, prestige damage, and loss of customer trust. FinTech companies must invest in robust cyber security measures to protect their systems and data (Bhandari, 2021).

Access to funding is also a challenge for many FinTech market players. While FinTech has been attracting significant investment in recent years, there is still a gap between the funding needs of start-ups and the availability of investment. This is particularly true for early-stage FinTech companies, which may struggle to secure funding without a track record of success (Bhandari, 2021).

Another challenge for FinTech market players is talent acquisition and retention. The FinTech industry requires a range of specialized skills, including expertise in technology, finance, and regulatory compliance. As the industry continues to grow, there is a high demand for skilled professionals, leading to talent shortages and fierce competition for top talent. FinTech companies must offer competitive compensation packages and positive work culture to attract and retain skilled employees (Leong & Sung, 2018).

Lastly, partnerships and collaborations are becoming increasingly important for FinTech market players. Traditional financial institutions have been slow to adopt FinTech innovations, and regulatory barriers can also mark it problematic for FinTech companies to function independently. By partnering with established financial institutions, FinTech companies can access new markets and customers while leveraging the expertise and resources of their partners. However, partnerships also require careful negotiation and management to ensure that both parties benefit from the collaboration (Berg et al., 2020).

In summary, while the FinTech industry presents significant opportunities for innovation and disruption, FinTech market players also face a range of challenges, including regulatory compliance, cyber security, access to funding, talent acquisition and retention, and

partnerships and collaborations. Successfully navigating these challenges will be vital to the sustained growth and success of the FinTech industry.

3.4 Analysis of Core Infrastructures of FinTech Ecosystem and Comparison

The FinTech ecosystem encompasses a range of companies and institutions, as well as technologies and regulations, that collaborate to provide financial services through innovative solutions (Du et al., 2022). The core infrastructure of FinTech ecosystems comprises several components, including payments and transfers, lending, wealth management, insurance, and regulatory compliance. This paper (Kapsis, 2020a) analyses the core infrastructure of FinTech ecosystems and compares the different models adopted by the industry players.

The payments and transfers component is a critical part of the FinTech infrastructure as it is the gateway to all financial transactions. FinTech start-ups like Adyen and Stripe are disrupting the traditional payments industry with their agile and flexible solutions. These companies leverage technology to streamline payment processing, reduce transaction costs, and offer customers greater flexibility and convenience (Jayalath & Premaratne, 2021).

The lending component of the FinTech ecosystem is another key driver of innovation, with startups like LendingClub, Prosper, and SoFi transforming the traditional lending industry (Jayalath & Premaratne, 2021). These platforms connect borrowers directly with investors, eliminating the need for intermediaries and lowering the cost of borrowing. FinTech lending platforms also use advanced algorithms to assess credit risk and determine loan eligibility, enabling faster and more accurate lending decisions.

Wealth management is another area where FinTech is driving significant change, with companies like Betterment and Wealth front offering low-cost and automated investment management services. These robo-advisory platforms use algorithms to create customized investment portfolios for clients based on their risk tolerance and investment goals. This has democratized access to wealth management services, making it possible for even small investors to benefit from professional investment management (Potdar & Pande, 2021).

Insurance is another area of FinTech disruption, with companies like Lemonade and Metro mile leveraging technology to offer new insurance products and services. Lemonade, for example, uses AI-powered bots to process claims, reducing processing times and costs and

improving the customer experience. Metro mile offers pay-per-mile insurance, enabling drivers to save money on their premiums if they drive less (Yan, Schulte, & Chuen, 2018).

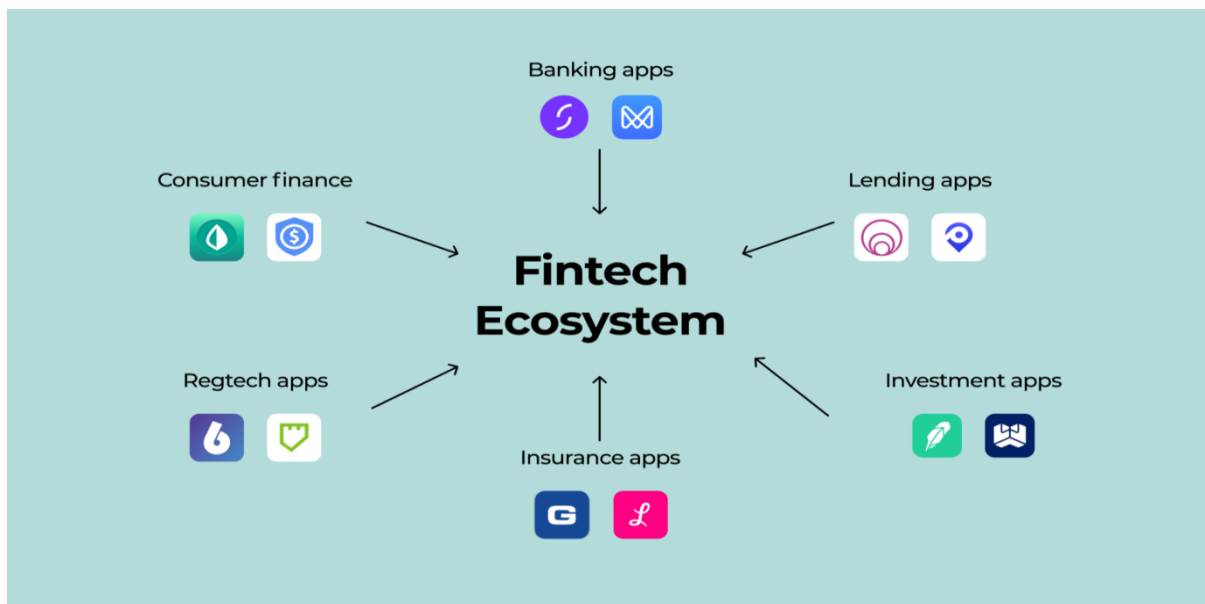
Finally, regulatory compliance is an essential component of the FinTech ecosystem, as FinTech companies must adhere to strict regulatory frameworks to ensure the security and privacy of customer data (Shashkova et al., 2020). Trunomi and Onfido are examples of RegTech companies that provide solutions to assist FinTech firms in meeting regulatory requirements, such as anti-money laundering (AML) and know-your-customer (KYC) obligations. These companies use advanced technology like blockchain, and machine learning to improve compliance processes and shrink the risk of fraud and money laundering cases.

In comparison, the traditional financial industry operates in silos, with banks, insurers, and investment firms working independently of each other. This has led to inefficiencies, higher costs, and limited access to financial services for many customers. The FinTech ecosystem, on the other hand, is characterized by collaboration and openness, with companies working together to deliver better and more innovative solutions.

One of the key advantages of the FinTech ecosystem is its ability to leverage data and analytics to deliver personalized financial solutions to customers. Traditional financial institutions have struggled to compete in this area, as they are often burdened with legacy IT systems and outdated business models (Tanda & Schena, 2019). FinTech companies, on the contrary, have been capable of forming their businesses from the ground up, using the latest technologies and business models to deliver better and more innovative services.

To summarize, the FinTech ecosystem is transforming the financial industry through the use of technology, innovation, and collaboration to provide customers with more personalized and improved financial services. The core infrastructure of the FinTech ecosystem comprises several components, including payments and transfers, lending, wealth management, insurance, and regulatory compliance. FinTech companies are disrupting traditional financial institutions by leveraging data and analytics to deliver more personalized services and by collaborating to create a more open and transparent financial system.

Figure - 3.3: FinTech Ecosystem



Source: <https://www.mckinsey.com>

3.5 Future of the European FinTech Market

The upcoming future of the European FinTech market is very promising as the market is mounting at a speedy pace. FinTech companies are expected to change the face of the financial industry in Europe. Many FinTech companies in Europe have achieved unicorn status, indicating their massive growth potential.

The European FinTech market is currently dominated by the UK, Germany, and France, but other countries such as Sweden, Switzerland, and the Netherlands are emerging as new FinTech hubs. The market is witnessing increased competition among FinTech companies, leading to more innovation and better customer experiences.

The adoption of artificial intelligence and machine learning technologies is a significant trend in the European FinTech market. FinTech companies are using AI and ML to improve customer experience, reduce costs, and enhance security. These technologies are also being used to develop more personalized financial products and services (Nicholls, 2019b).

Another trend is the rise of open banking, which is expected to transform the financial industry in Europe. Open banking allows customers to part their financial data with third-party benefactors, who can then use this data to offer personalized financial products and

services. This trend is expected to lead to more innovation and competition in the financial industry.

Regulation is a key factor that will shape the future of the European FinTech market. The European Union has introduced the Payment Services Directive 2 (PSD2) and the General Data Protection Regulation (GDPR) are two important regulations impacting the financial industry in Europe. to provide a regulatory framework for the FinTech industry. The PSD2 mandates banks to share their client data with third-party benefactors, while the GDPR ensures the protection of customer data. FinTech companies need to comply with these regulations to operate in the European market.

One of the major tasks fronting the European FinTech market is the shortage of skilled talent. FinTech companies need experts in areas such as AI, ML, cyber security, and blockchain to develop innovative financial products and services. However, there is a shortage of skilled professionals in these areas, which is hindering the growth of the FinTech industry.

Another challenge is the lack of funding for FinTech companies. Although the European Union is making significant investments in the FinTech industry, many FinTech start-ups struggle to secure funding. This is due to the high risk involved in investing in start-ups and the non-existence of responsiveness about FinTech among traditional investors.

In brief, the European FinTech market is poised for significant growth in the coming years. The market is driven by several factors, including the adoption of mobile banking, government initiatives, and the demand for pioneering financial products and amenities. The use of AI and ML know-how and the rise of open banking is expected to drive innovation and competition in the financial industry. However, the shortage of skilled talent and lack of funding for start-ups are major encounters that need to be addressed to ensure the continued growth of the FinTech industry in Europe.

Chapter – 4 The FinTech Regulation Framework

4.1 Policy Implications of FinTech

FinTech policy refers to the set of rules, regulations, and guidelines developed by government bodies and regulatory authorities to ensure that financial technology (FinTech) companies operate in a safe, secure, and fair manner (Hodson, 2021). The purpose of FinTech policy is to balance innovation and risk so that consumers can benefit from FinTech innovations while ensuring their protection. FinTech policy covers a wide range of areas, including licensing and registration requirements, consumer protection, data privacy and security, “anti-money laundering (AML) and counter-terrorism financing (CFT) regulations”, and cyber security measures (Djakova, 2017). These policies are designed to ensure that FinTech companies operate in a mode that is transparent, fair, and accountable while also protecting consumers' privacy and financial security. One of the key objectives of FinTech policy is to promote innovation and competition in the financial sector. To achieve this goal, regulatory bodies and governments have taken a number of steps to support the development of FinTech companies (Ramdani, Rothwell, & Boukrami, 2020). As part of regulatory measures, monitoring sandboxes have been established to offer a secure and controlled environment for FinTech firms to test their products and services while being exempt from full regulatory requirements. Another important aspect of FinTech policy is ensuring that consumers have access to fair and transparent financial services. This includes measures to protect consumers from fraudulent and unscrupulous practices, as well as to ensure that FinTech companies are fully transparent in their pricing and terms and conditions. FinTech policy also seeks to ensure that consumers have access to information about the risks associated with FinTech products and services and to provide them with tools to make informed decisions about their financial choices (Petrevska Nechkoska, Trajkovski, & Kostoska, 2019).

Additionally, these consumer protection measures, FinTech policy also aims to prevent financial crime and promote financial stability. Regulations around anti-money laundering and countering the financing of terrorism require FinTech companies to implement robust procedures to prevent such activities. FinTech policy also covers cyber security measures, which are designed to protect FinTech companies and their customers from cyber threats and attacks (Bassetti, Galvez, Pavesi, & Del Sorbo, 2020; Breidbach & Ranjan, 2017; Petrevska Nechkoska et al., 2019).

In Europe, FinTech policy is primarily governed by the European Union (EU), which has established a number of regulatory frameworks to ensure that FinTech companies operate in a safe and secure manner. The EU's Payment Services Directive 2 (PSD2), for example, is a regulatory framework that provides a set of standards and requirements for payment service providers, including FinTech companies (Guild, 2017).

Data privacy and protection are also crucial aspects of FinTech policy in Europe. The EU's General Data Protection Regulation provides guidelines for the collection, storage, and utilization of personal data by companies operating within the EU, including FinTech firms. The GDPR has been designed to ensure that consumers have control over their personal data and that it is protected from misuse or abuse by companies (Muhammad et al., 2022).

FinTech policy plays a critical role in ensuring that FinTech companies operate in a manner that is safe, secure, and fair. By promoting innovation while protecting consumers, FinTech policy might support drive evolution and prosperity in the financial division while also ensuring that clients are protected and supported in their financial decisions (Makina, 2019; Mills et al., 2016).

FinTech is the practice of know-how to develop the conveyance of financial services. FinTech has been increasingly adopted across the globe, and it has significant consequences for the financial industry and the economy at large (Giglio, 2021). The adoption of FinTech raises various policy implications, and policymakers have a critical role to play in nurturing a favourable environment for FinTech innovation to thrive. One of the interesting papers examines the policy implications of FinTech and how policymakers can address them to enhance the benefits of FinTech to the financial industry and the economy (Iris HY Chiu, 2016).

4.1.1 Regulation

One of the critical policy implications of FinTech is regulation. The swift expansion and development of FinTech have created a regulatory gap as the traditional regulatory framework is inadequate to address the new risks and challenges that FinTech poses. Policymakers must strike an equilibrium between endorsing innovation and protecting consumers, financial stability, and privacy (Iris HY Chiu, 2017). The regulatory framework should be agile and flexible to adapt to the rapidly evolving FinTech landscape. Policymakers should also collaborate with industry players to develop industry-specific regulations that promote innovation and competition.

4.1.2 Data Privacy

Another policy implication of FinTech is data privacy. FinTech relies heavily on data, and this data is susceptible to cyber threats and breaches. Policymakers should ensure that there are adequate measures in place to protect consumers' data and privacy (A. Boot, Hoffmann, Laeven, & Ratnovski, 2021). This can be done through the implementation of robust data protection regulations and guidelines for data collection, storage, and usage. Policymakers should also collaborate with industry players to develop data security standards and promote the use of data encryption and other data security technologies.

4.1.3 Financial Inclusion

FinTech has the potential to promote financial inclusion by improving access to financial services for underprivileged areas. However, there is a risk that FinTech may exacerbate existing inequalities if it is not implemented equitably. Policymakers should develop policies that promote financial inclusion through FinTech. This can be achieved through the provision of incentives for FinTech companies to serve underserved populations, the growth of digital infrastructure in remote areas, and the promotion of financial literacy among underserved populations (Gabor & Brooks, 2017).

4.1.4 Competition

FinTech has disordered the traditional financial industry, and this has created both opportunities and challenges. One of the challenges is the concentration of market power among a few large FinTech players, which can hinder competition and innovation. Policymakers should develop policies that promote competition and level the playing field for all troupes in the FinTech industry. This can be done through the progress and development of open banking standards, the promotion of interoperability between FinTech players, and the prevention of anti-competitive practices (Philippon, 2019).

4.1.5 Cyber Security

FinTech relies heavily on technology, and this technology is susceptible to cyber threats and attacks. Cyber security is a critical policy implication of FinTech as a cyber-attack can have weighty consequences for the financial industry and the economy at large. Policymakers should develop policies and regulations that promote cyber security in the FinTech industry. This can be achieved through the implementation of cyber security standards, the promotion of preeminent practices for cyber security, and progress in building secure networks (Kapsis, 2020a).

4.1.6 Consumer Protection

FinTech has the probability of increasing consumer security by providing consumers with more control over their financial data and transactions. However, there is a risk that FinTech may expose consumers to new risks, such as fraud and mis-selling. Policymakers should develop policies that promote consumer protection in the FinTech industry. This can be achieved through the implementation of consumer protection regulations, the development of consumer protection guidelines, and the provision of consumer education on the risks and benefits of FinTech (Makina, 2019).

FinTech has the ability to transform the financial industry and promote economic growth. However, its adoption raises various policy implications that policymakers must address to enhance its benefits and mitigate its risks. Policymakers should collaborate with industry players.

4.2 Policy Implications of FinTech in Europe

The growth of FinTech in Europe has raised a number of policy concerns for regulators and policymakers. While FinTech has the prospective to deliver weighty benefits to clients and the financial sector, it also poses a number of risks and challenges that require careful consideration. This article discusses some of the key policy implications of FinTech in Europe and the measures that policymakers are taking to address them (Bernoth, Gebauer, & Schäfer, 2017).

4.2.1 Regulatory Challenges

One of the substantial challenges for representatives is how to regulate the rapidly evolving FinTech sector. FinTech companies operate in a wide variety of areas, from payments and lending to insurance and wealth management. Many of these areas are subject to existing regulations, but the rapid pace of innovation in FinTech has created a number of regulatory challenges (Wonglimpiyarat, 2018).

One of the challenges is how to ensure that FinTech companies are subject to appropriate regulatory oversight. Many FinTech companies operate across borders which can create trials and challenges for regulators in terms of jurisdiction and coordination. In addition, many FinTech companies operate in areas that are not currently subject to regulation, which can create gaps in consumer protection (Boustani, 2020).

To address these challenges, regulators in Europe are working to develop a coordinated approach to FinTech regulation. The European Union has established a number of initiatives to endorse and promote FinTech, including the EU FinTech Action Plan and the European Commission's FinTech Lab. These initiatives aim to create a regulatory structure that is both supportive of innovation and effective in protecting consumers (Tanda & Schena, 2019).

4.2.2 Consumer Protection

Another key policy concern is how to ensure that consumers are protected in the rapidly evolving FinTech market. FinTech has the potential to deliver significant benefits to consumers, including lower costs, greater convenience, and improved access to financial services. Nevertheless, FinTech also poses hazards to consumers, particularly in areas such as data privacy, cyber security, and fraud (Rupeika-Apoga & Thalassinou, 2020).

To address these concerns, regulators in Europe are working to develop a framework for FinTech that includes strong consumer protection measures. This includes measures to ensure that FinTech companies are transparent about their products and services and that consumers are able to make informed decisions about the risks and benefits of using diversified FinTech products and services.

4.2.3 Data Privacy

Data privacy is a particularly important issue for FinTech companies, as they often handle sensitive personal and financial information. This creates risks for consumers, particularly in areas such as identity theft and fraud. To address these concerns, regulators in Europe are working to develop a framework for data privacy that is both effective and flexible enough to accommodate the rapidly evolving FinTech sector (Pejkovska, 2018).

The General Data Protection Regulation, introduced in May 2018, is one of the key policy initiatives in promoting financial inclusion through FinTech. The General Data Protection Regulation provides a framework for data privacy that applies to all companies operating in Europe, including FinTech companies. The regulation includes measures to protect consumers, such as the right to access and control their personal data, the right to be forgotten, and strict rules on data breach notification.

4.2.4 Financial Stability

FinTech also poses risks to financial stability, predominantly in areas such as systemic risk and operational risk. Systemic risk arises when the failure of one FinTech company has a cascading effect on the wider financial system. Operational risk arises when FinTech

companies experience operational failures, such as data breaches or system failures (Paul & Sadath, 2021).

To address these risks, regulators in Europe are working to develop a framework for FinTech that includes measures to promote financial stability. This includes measures to ensure that FinTech companies are subject to suitable regulatory oversight and that they have adequate capital and risk management systems in place.

FinTech has the potential to distribute weighty benefits to consumers and the financial sector, but it also poses risks and challenges that require careful consideration. Regulators in Europe are working to develop a framework for FinTech that is both supportive of innovation and effective in protecting consumers.

4.3 FinTech Policy Trade-offs

FinTech policy trade-offs refer to the challenges that policymakers face when creating regulatory frameworks that balance the need for innovation and competition with the need for consumer protection and financial stability. As FinTech innovation continues to disrupt traditional financial services, policymakers must navigate these trade-offs to safeguard that the doles of FinTech are maximized while risks are minimized.

One of the main FinTech policy trade-offs is the tension between innovation and consumer protection. Policymakers must balance the need to encourage FinTech revolution and innovation with the need to protect consumers from potential harm. For example, FinTech platforms that offer innovative lending solutions may not have the same level of consumer protection as traditional banks. Regulators must ensure that these platforms are transparent and provide adequate disclosures to consumers to prevent predatory lending practices (Abu Daqar et al., 2021).

Another trade-off is the tension between innovation and financial stability. Policymakers must ensure that FinTech innovations do not pose risks to financial stability. For example, the growth of peer-to-peer lending platforms may upsurge systemic hazards if they are not adequately regulated. Regulators must ensure that these platforms have appropriate risk management frameworks in place to prevent potential contagion effects (Frost, 2020).

The tension between innovation and competition is also a significant FinTech policy trade-off. Policymakers must balance the need to promote innovation with the need to prevent

market concentration (Haqqi, 2020; Jayalath & Premaratne, 2021). For example, FinTech platforms may have a competitive advantage over traditional financial institutions due to lower regulatory costs. Regulators must ensure that competition is not distorted and that FinTech platforms are subject to similar supervisory standards as traditional financial organizations.

Balancing privacy and data protection is another important consideration in FinTech policy. FinTech platforms depend on the collection and analysis of large amounts of data to offer innovative services. However, policymakers must balance the benefits of data-driven innovation with the need to protect consumer privacy. Regulators must ensure that FinTech platforms are transparent about their data collection and use practices and that consumers have control over their personal data (Saksonova & Kuzmina-Merlino, 2017).

Lastly, there exists a tension between innovation and financial inclusion in FinTech. While FinTech innovations have the potential to improve access to financial services for underserved populations, there is a need to ensure that these innovations do not exclude vulnerable groups or create new forms of financial exclusion. Although, policymakers must ensure that these innovations do not widen existing inequalities or create new ones. Regulators must ensure that FinTech platforms are reachable and affordable to all clients, regardless of their socio-economic status.

In Europe, the FinTech policy trade-offs are reflected in the regulatory frameworks of the European Union (EU). The EU has adopted a technology-neutral approach to regulation, which seeks to promote innovation while ensuring that consumer protection and financial stability are not compromised (Boustani, 2020; Sood & Singh, 2022). In addition, the EU has implemented a regulatory sandbox framework that allows FinTech startups to test their innovative products and services in a safe environment without being fully subject to regulatory requirements. Nevertheless, the EU encounters challenges in balancing innovation and consumer protection. For example, the EU's "General Data Protection Regulation (GDPR)" imposes strict limitations on the collection and use of personal data, which may impede the ability of FinTech platforms to develop and deliver innovative services.

The EU is also struggling to harmonize its regulatory framework across member states, which may create a fragmented regulatory environment that hinders innovation (Tsanis & Stouraitis, 2022).

In conclusion, the FinTech policy trade-offs are complex and require policymakers to balance competing objectives. While innovation is important, policymakers must ensure that FinTech innovations do not compromise consumer protection, financial stability, competition, privacy, and financial inclusion. The EU has taken steps to create a regulatory framework that promotes innovation while addressing these trade-offs. However, policymakers must continue to monitor FinTech developments and adjust their policies to safeguard that the welfare of FinTech is exploited while hazards are minimized.

4.4 FinTech Policy Trade-offs Comparative Study of Asia, Europe, and America

In recent years, FinTech has emerged as a highly disruptive force in the financial services industry, completely transforming the ways in which financial services are distributed and consumed. As the Financial Technology industry is expanding around the world faces a number of challenges and trade-offs in designing policies that promote innovation while safeguarding consumer protection and financial stability (Rabbani, 2022; Wonglimpiyarat, 2018).

4.4.1 Asia

Asia has emerged as a hotbed of FinTech activity, with China, India, and Southeast Asia being counted among the world's fastest-growing markets. However, the region also contends with multiple obstacles in regulating the FinTech industry (Pollari, 2016). One key trade-off is between promoting innovation and maintaining financial stability. Regulators in China have adopted a relatively relaxed approach towards the FinTech industry, which has allowed fast-growing companies like Alibaba's Ant Financial and Tencent's WeChat Pay to thrive. However, concerns about financial stability have led to increased regulatory scrutiny in recent years, with regulators implementing new rules to curb risks in the peer-to-peer lending and online payment sectors (Wonglimpiyarat, 2018; Xiang et al., 2017).

Another key trade-off is between promoting financial inclusion and protecting consumer rights. FinTech has promise for increasing availability and financial services for underserved populations, but there is also a risk that consumers may be exploited or defrauded by unscrupulous operators. Regulators in Asia are grappling with how to strike a balance between these competing goals (Williams, 2020). In India, for example, the government has launched a number of initiatives to promote financial inclusion, including the Aadhaar biometric identification system and the Pradhan Mantri Jan Dhan Yojana program, which

aims to provide every household in the country with a bank account. However, concerns about data privacy and security have led to legal challenges to these initiatives.

4.4.2 Europe

Europe has been a leader in FinTech regulation, with a number of countries implementing proactive policies to support the industry. However, the region also faces a number of challenges in balancing innovation with consumer protection and financial stability. One key trade-off is between promoting competition and maintaining a level playing field. It is possible that FinTech will cause a paradigm shift in the traditional financial services providers and promote competition, but there is also a risk that new entrants may or may not be required to adhere to the same set of rules as established firms (Potdar & Pande, 2021; Puschmann, 2017). Regulators in Europe are grappling with how to ensure that FinTech companies are subject to appropriate regulatory oversight while also promoting competition and innovation.

Another key trade-off is between promoting data sharing and protecting data privacy. FinTech relies heavily on data, and there is a growing demand for data sharing between financial services providers and FinTech companies (Pejkovska, 2018). However, concerns about data privacy and security have led to calls for tighter regulation of data sharing. In Europe, the “General Data Protection Regulation (GDPR)” was introduced to improve security for personal information and give consumers more control over their data. However, some argue that the GDPR may also hinder innovation by imposing additional costs and regulatory burdens on FinTech companies (Leal et al., 2022).

4.4.3 America

America has been a leader in FinTech innovation, with companies like PayPal, Square, and Stripe transforming the way payments are made and processed. However, the country also faces a number of challenges in regulating the industry. One key trade-off is between promoting innovation and protecting consumers. The possibilities of FinTech are to deliver new and innovative “banking and other financial services”, but there is also a risk that consumers may be subject to fraud or other abuses. Regulators in the US are grappling with how to strike a balance between these competing goals (Nabilou, 2020; Nicholls, 2019a).

Another key trade-off is between promoting competition and maintaining financial stability. While traditional banking institutions may be threatened by FinTech and services providers and promote competition, there is also a risk that new entrants may not be subject to.

4.5 Policy Implications of FinTech and Their Impact on Financial Stability

Fears have been voiced in response to the rapid expansion of the FinTech industry and its impact on financial stability. While FinTech has the potential to improve financial inclusion, reduce costs, and increase efficiency, it also poses risks to financial stability. Therefore, policymakers must strike a balance between promoting innovation and safeguarding financial stability (Nikkel, 2020b).

One policy implication of FinTech is the need for regulatory and supervisory frameworks that are adaptable and responsive to technological change. The traditional approach to regulation may not be suitable for FinTech, as it operates in a rapidly evolving environment with a high degree of innovation. The regulatory framework must be designed to ensure that FinTech firms operate within a stable and secure environment (Paul & Sadath, 2021). Regulators must also be able to keep up with technological advancements and evaluate the costs and gains of using cutting-edge FinTech services and solutions.

Another policy implication is the requirement for cooperation between FinTech and conventional financial institutions. FinTech firms often lack the infrastructure, funding, and expertise of traditional financial institutions. Conversely, traditional financial institutions can benefit from the innovation and efficiency of FinTech. Collaboration between these two sectors can create a symbiotic relationship that benefits both parties and can lead to a more stable financial system (Pejkovska, 2018).

FinTech also poses challenges to “data privacy and cyber security”. As FinTech firms, when organizations acquire and process a lot of data, such data is vulnerable to abuse and theft. The regulatory framework must be designed to protect consumer privacy and ensure that data is used only for its intended purposes. Additionally, regulators must ensure that FinTech firms have robust cyber security measures in place to prevent data breaches and other cyber-attacks (Pradhan & Wang, 2020).

FinTech can also have an impact on monetary policy. As FinTech firms offer new payment methods and services, they can affect the flow of currency and the velocity of money. This can have implications for monetary policy, as central banks must ensure that the money supply is appropriate for economic conditions. Therefore, policymakers must be aware of must account for FinTech's possible effects on the currency market and make necessary adjustments (Ringe & Christopher, 2020; Romānova & Kudinska, 2016; Rupeika-Apoga & Thalassinou, 2020).

Finally, FinTech can affect financial stability by increasing the speed and volume of financial transactions. While this can lead to increased efficiency and lower costs, it can also increase the risk of financial contagion. As financial transactions become more interconnected and complex, the failure of one firm can quickly spread to others, leading to a systemic crisis. Policymakers must ensure that the financial system has the capacity to absorb shocks and prevent contagion.

In conclusion, the policy implications of FinTech from the perspective of financial stability are complex and require careful consideration. While FinTech has the potential to improve financial inclusion, reduce costs, and increase efficiency, it also poses risks to financial stability. Policymakers must strike a balance between promoting innovation and safeguarding financial stability. This requires regulatory and supervisory frameworks that are adaptable and responsive to technological change, collaboration data privacy and cyber security concerns between FinTech companies and more traditional banks, awareness of the impact on monetary policy, and consideration of the potential for increased financial contagion.

4.6 Policy Implications of FinTech and Their Impact on Consumer Protection

The rapid growth of FinTech has been disruptive to the traditional banking industry and has brought about several advantages, such as greater financial inclusion, increased efficiency, and lower costs. However, FinTech has also raised concerns about consumer protection.

FinTech products and services are delivered through a variety of channels, including online platforms, mobile apps, and other digital means. While these channels have made financial services more accessible to consumers, they have also created new risks and vulnerabilities. Consumers may be susceptible to fraud, cyber-attacks, data breaches, and other forms of financial harm. In addition, FinTech products and services may be complex and difficult to understand, leading to confusion and misunderstanding (Ringe & Christopher, 2020; Románova & Kudinska, 2016; Rupeika-Apoga & Thalassinou, 2020).

In order to address these concerns, policymakers need to take a proactive approach to FinTech regulation. They ought to find an acceptable balance between promoting innovation and protecting consumers. Some of the policy implications for consumer protection in FinTech are as follows:

4.6.1 Enhancing Disclosure Requirements

FinTech firms should be required to provide clear and concise disclosures about the risks associated with their products and services. This can help consumers make informed decisions about whether to use a particular product or service. Regulators can also require FinTech firms to disclose information about their ownership structure, data-sharing practices, and other relevant information (Potdar & Pande, 2021).

4.6.2 Strengthening Cyber Security Standards

FinTech firms should be held to high cyber security standards to protect against data breaches and cyber-attacks. Regulators can require FinTech firms to implement security protocols, such as two-factor authentication, encryption, and secure data storage. They can also require regular security audits to identify vulnerabilities and address them promptly.

4.6.3 Implementing Consumer Protection Standards

FinTech firms should be held to the same consumer protection standards as traditional financial institutions. Regulators can require FinTech firms to comply with fair lending laws, anti-money laundering regulations, and other consumer protection standards. They can also require FinTech firms to provide consumer dispute resolution mechanisms, such as arbitration or mediation (Románova & Kudinska, 2016).

4.6.4 Encouraging Innovation

Policymakers should encourage innovation in FinTech while also promoting consumer protection. They can establish permissive regulatory environments for innovative financial technologies firms to try out their goods for sale and services within strict confines. This can help FinTech firms identify and address consumer protection risks before they launch their products and services in the market (Saksonova & Kuzmina-Merlino, 2017).

4.6.5 Facilitating Collaboration

Policymakers can facilitate collaboration contrast between FinTech companies and more conventional financial institutions to promote consumer protection. For example, they can encourage FinTech firms to partner with banks to provide consumer protection services, such as fraud detection and prevention. They can also encourage FinTech firms to share information about consumer protection risks with traditional financial institutions (Vasenska et al., 2021).

In conclusion, FinTech has brought about many benefits, but it has also raised concerns about consumer protection. Government officials must take the initiative in FinTech regulation to

strike a balance between promoting innovation and protecting consumers. They should enhance disclosure requirements, strengthen cyber security standards, implement consumer protection standards, encourage innovation, and facilitate mutual cooperation between FinTech companies and conventional banks. By doing so, policymakers can promote the growth of FinTech while also protecting consumers.

4.7 Policy Implications of FinTech and Their Impact on Competition

The financial services sector has been revolutionized by the rise of financial technology (FinTech), providing consumers with innovative products and services, expanding the availability of financial services, and fostering more rivalry among financial institutions. However, the rapid development of FinTech has also raised several policy implications, including the impact on competition (Saksonova & Kuzmina-Merlino, 2017). This paragraph intends to discuss the potential impact of FinTech on competition in the financial industry from a policy perspective. The adoption of FinTech has the potential to bring in new products and services that can lower transaction costs, provide a better customer experience, and ultimately increase competition within the financial industry.

By leveraging technology, financial technology businesses can provide more effective financial services and affordable than traditional financial institutions. For example, peer-to-peer lending platforms enable borrowers to access credit at lower rates, while robo-advisors offer investment advice and management at a fraction of the cost of traditional financial advisors.

However, the rise of FinTech has also introduced new challenges to competition policy. One major concern is the potential for FinTech companies to gain excessive market power and dominate the market, leading to reduced competition and increased concentration. As FinTech companies continue to grow, they may become dominant players in their respective markets, potentially leading to reduced competition and higher prices (Treleven, 2015; Yan et al., 2018).

To address these concerns, policymakers must ensure that the regulatory framework is sufficiently flexible to accommodate the rapidly evolving FinTech landscape while also safeguarding competition. One potential approach is in order to implement a "regulatory sandbox," a mechanism that gives FinTech firms the freedom to test out their wares without

fear of repercussions while regulators monitor their activities to ensure compliance with regulatory requirements (Rupeika-Apoga & Thalassinou, 2020). The regulatory sandbox approach has been adopted by several countries, including the UK, Singapore, and Australia, and has proved effective in promoting innovation while mitigating Possible risks for customers and the financial system.

Another approach to promoting competition in the FinTech industry is to encourage collaboration between “traditional financial institutions and FinTech companies”. By collaborating, financial institutions can leverage the innovative technologies and business models of FinTech companies, while FinTech companies can benefit from the regulatory expertise and customer base of traditional financial institutions. This approach has already been adopted by several financial institutions, such as JP Morgan, which has partnered with FinTech companies to develop new payment systems and digital platforms (Tsanis & Stouraitis, 2022).

Finally, policymakers must also address the issue of data access, which is critical for promoting competition in financial technology. Data is the lifeblood of FinTech companies, as it enables them to develop innovative products and services and enhance customer experience. However, access to data is often restricted by traditional financial institutions, who are reluctant to share their data with FinTech companies due to concerns about data privacy and security (Vasenska et al., 2021; Wewege, Lee, & Thomsett, 2020).

To address this issue, policymakers must ensure that FinTech companies have access to the necessary data to compete effectively in the market. One potential approach is to promote the development of open banking systems, which allow users to disclose financial information to outside parties, such as FinTech firms. Open banking systems have been accepted by a number of nations, the United Kingdom and Australia included, and have proved effective in promoting competition in the financial industry.

In conclusion, FinTech's disruptive potential is reshaping the financial sector by increasing competition, democratizing access to financial services, and raising the quality of life for consumers. However, the rapid development of FinTech has also introduced new challenges to competition policy. Policymakers must ensure that the regulatory framework is sufficiently flexible to accommodate the rapidly evolving FinTech landscape while also safeguarding competition. By adopting a regulatory sandbox, encouraging collaboration between traditional financial institutions and FinTech companies, and promoting the development of

open banking systems, policymakers can ensure that FinTech continues to promote competition in the financial industry.

How money and banking services are provided has been entirely upended by FinTech. It has made financial transactions and other commercial activities more quickly, easily, and efficiently completed, which is beneficial to both customers and enterprises. Fraudulent actions, however, have also increased along with the popularity of FinTech. This post will go over the various forms of fraud that can occur in the FinTech industry.

4.8 FinTech Fraud

FinTech fraud is a growing concern globally. Here are some of the prevention measures taken in these regions to combat FinTech fraud.

4.8.1 KYC (Know Your Customer) Procedures

FinTech companies are required to follow strict KYC procedures to verify the identity of their customers. This includes obtaining copies of official identification documents, conducting background checks, and using biometric authentication. “Artificial Intelligence (AI) and Machine Learning (ML)”: Many FinTech companies are incorporating AI and ML into their fraud detection systems. These technologies can analyze vast amounts of data in real-time to detect fraudulent activity (Cumming, 2020).

4.8.2 Collaboration with Government Agencies

Many FinTech companies are collaborating with government agencies to prevent FinTech fraud. The Monetary Authority of Singapore (MAS) has set up the FinTech and Innovation Team, which collaborates with FinTech firms to create innovative solutions to combat fraudulent activities. This initiative highlights the importance of regulatory bodies working with FinTech companies to promote the growth of the industry while ensuring consumer protection (Alekseenko, 2022).

4.8.3 Secure Payment Gateways

FinTech companies are using secure payment gateways to prevent fraudulent transactions. These gateways use encryption technologies to protect the customer's financial information (Bradford, 2020).

4.8.4 Two-Factor Authentication

Many FinTech companies are using two-factor authentication to prevent unauthorized access to customer accounts. This involves verifying the customer's identity through two different methods, such as a password and a fingerprint scan.

4.8.5 Fraud Detection Tools

FinTech companies in America are using advanced fraud detection tools to prevent fraudulent transactions. These tools use machine learning and data analysis to detect suspicious activity (Demertzis, Merler, & Wolff, 2018).

4.8.6 Collaboration with Law Enforcement

Many FinTech companies in different parts of the world are collaborating with law enforcement agencies to prevent FinTech fraud. A dedicated team within the Federal Bureau of Investigation (FBI) in the United States is tasked with investigating FinTech fraud.

4.8.7 Education and Awareness

FinTech companies are educating their customers about the risks of FinTech fraud and providing them with tips on how to protect themselves. They are also raising awareness about the latest fraud schemes and how to identify them (Demertzis et al., 2018).

4.8.8 Regular Security Audits

FinTech companies are conducting regular security audits to identify vulnerabilities and potential security breaches. They are also implementing measures to prevent these vulnerabilities from being exploited (Demertzis & Wolff, 2019).

In conclusion, FinTech fraud is a global problem, and FinTech companies are taking steps to prevent it. These measures include KYC procedures, AI and ML, secure payment gateways, fraud detection tools, collaboration with law enforcement, education and awareness, and regular security audits. By implementing these measures, FinTech companies can protect their customers from financial losses and maintain the integrity of the financial system.

4.9 Identity Theft

Identity theft is a type of fraud where a criminal steals someone's personal information and uses it for fraudulent purposes. The rise of online shopping has made it easier for cybercriminals to engage in identity theft and steal sensitive information such as credit card numbers and bank account details. This information can be used to fraudulently open credit accounts or obtain loans in the name of the victim (Kostrubiec, 2023).

In the financial technology industry, identity theft is a major concern because they store large amounts of sensitive data. To mitigate this risk, FinTech companies use strong encryption and multifactor authentication to protect their users' personal information.

4.9.1 Phishing Scams

Phishing scams are another type of FinTech fraud where criminals use fraudulent emails or websites to trick users into revealing their personal and financial information. These emails and websites look like they come from legitimate sources such as banks or FinTech companies, but they are actually designed to steal personal information (Kostrubiec, 2023).

FinTech companies can combat phishing scams by educating their users on how to identify and avoid these scams. They can also use fraud detection software to identify suspicious activity on their platforms.

4.9.2 Account Takeover

Account takeover is a type of FinTech fraud where criminals gain access to a user's account by stealing their login credentials. Once they have access, they can make unauthorized transactions or steal sensitive information (Iris HY Chiu, 2017; Cumming, 2020).

FinTech companies can prevent account takeover by using strong authentication methods such as biometric authentication and two-factor authentication. In addition, AI and ML can keep an eye out for fraudulent conduct by monitoring user behaviour (Iris HY Chiu, 2016).

4.9.3 Money Laundering

Money laundering is a type of FinTech fraud where criminals use financial transactions to hide the proceeds of illegal activities. FinTech companies are especially vulnerable to money laundering because they often deal with large volumes of transactions (Date, Tanjung, Lemmen, & van den Hauwe, 2020).

To combat money laundering, FinTech companies must comply with anti-money laundering regulations and implement robust fraud detection and prevention systems. They can also use “artificial intelligence and machine learning” to detect suspicious activity and flag it for further investigation.

4.9.4 Social Engineering

Social engineering is a type of FinTech fraud where criminals use psychological manipulation to trick users into divulging sensitive information. They may impersonate someone in authority or use emotional appeals to gain the victim's trust.

FinTech companies can combat social engineering by educating their users on how to identify and avoid these scams. They can also use AI tools and machine learning to check suspicious activity and flag it for further investigation (Kostrubiec, 2023; Kovas & Intelligence, 2021; Leal et al., 2022; Leong & Sung, 2018; Messy, 2017).

In conclusion, FinTech fraud is a serious threat to the financial industry. FinTech companies must take steps to protect their users from fraud by using strong authentication methods, educating their users, and implementing robust fraud detection and prevention systems. By doing so, they can ensure that their users can enjoy the benefits of FinTech without being victimized by fraudsters.

4.9.5 Cyber Security Threats

Cybersecurity threats involve malicious activities that are designed to undermine the confidentiality, integrity, and availability of computer systems, networks, and data. These threats can be executed by attackers using various methods and techniques to obtain unauthorized access to sensitive information or to harm computer systems and networks. In other words, cybersecurity threats encompass a wide range of actions that are intended to compromise the security of information and information systems (Messy, 2017). Organizations of every kind and size are facing increasingly difficult problems as a result of the increasing sophistication and complexity of cyber security threats in recent years. The probable consequences of a few of the most widespread cyber security threats are explored here.

4.9.5.1 Malware

Malware is a kind of harmful program created to invade computer systems and networks, typically without the user's awareness or permission. Malware may exist in various forms, such as ransomware, trojans, viruses, and worms. Once installed on a system, malware can steal sensitive information, encrypt files, and cause system crashes or slowdowns (Nikkel, 2020b).

4.9.5.2 Phishing

Phishing refers to a social engineering tactic that leverages email or text messages to deceive users into disclosing sensitive information, such as social security numbers, credit card numbers, or login credentials. Typically, these attacks employ various techniques, such as

fear, urgency, or curiosity, to manipulate users into clicking on links or opening attachments that may contain malware or direct them to bogus login pages (Nikkel, 2020a).

4.9.5.3 Distributed Denial of Service (DDoS) Attacks

Distributed denial of service attacks aims to make websites and other online resources inaccessible to their intended audience by flooding them with fake or malicious traffic. Botnets, or networks of infected computers under remote control, are frequently used to launch distributed denial of service assaults (Kovas & Intelligence, 2021).

4.9.5.4 Man-in-the-middle (MITM) Attacks

When an attacker acts as a middleman between two parties who think they are interacting directly with one another, this is known as a man-in-the-middle (MITM) attack. This form of attack can be utilized for two main purposes: stealing sensitive information or manipulating communication for malicious objectives.

4.9.5.5 Insider Threats

Insider threats refer to security breaches that are perpetrated by individuals within an organization who have authorized access to sensitive information or computer systems. These threats can be either intentional or unintentional and can lead to data breaches, theft, or sabotage. Damage to finances, credibility, and even legal ramifications can all result from cyber security breaches. Firewalls, antivirus applications, intrusion detection devices, and training for staff members are just some of the security measures that businesses should use to protect themselves from cyber-attacks (Cumming, 2020). In addition, doing regular security audits and assessments can assist in finding security holes in your system so you can patch them before they're exploited by hackers. Given the ever-changing nature of cyber threats, businesses must take preventative measures to ensure the safety of their data and property (Herrera & Vadillo, 2018).

4.10 Prevention of FinTech Fraud in Europe

The quick expansion of financial technology (FinTech) in Europe has created more opportunities for fraudsters to exploit vulnerabilities within the system. The fraud presents a significant threat to the FinTech sector since it can erode trust in financial institutions and cause substantial financial losses for both companies and consumers. In order to combat FinTech fraud, there are a number of prevention measures that can be put in place (Kostrubiec, 2023).

One of the most important ways to prevent FinTech fraud is through the use of effective identity verification processes (Abu Daqar et al., 2021). This can involve a range of techniques, including biometric identification, facial recognition, and the use of artificial intelligence to detect unusual behaviour patterns. By verifying the identity of customers and partners, FinTech businesses can reduce the risk of fraud and ensure that they are dealing with legitimate individuals (Bernoth et al., 2017; Bhandari, 2021).

Another key prevention measure is the use of encryption and secure data storage methods. This involves protecting sensitive data such as customer information, payment details, and transaction records from unauthorized access. FinTech businesses must also regularly update their security protocols in response to new threats and vulnerabilities (Baba et al., 2020).

"Strong anti-money-laundering (AML)" and "know-your-customer (KYC)" rules are essential in the fight against fraud committed using FinTech. These policies require FinTech companies to verify the identities of their customers and partners and monitor transactions for suspicious activity. They also involve reporting any suspicious transactions to the relevant authorities (Messy, 2017).

FinTech companies can also prevent fraud by partnering with established financial institutions, such as banks, to leverage their expertise in fraud prevention. This can involve sharing data and insights on fraudulent activity, as well as collaborating on the development of new security measures.

Finally, consumer education and awareness campaigns can help to prevent FinTech fraud. FinTech companies can provide information to their customers on how to protect themselves from fraud, such as by avoiding phishing scams and using secure passwords. They can also educate consumers on the warning signs of fraudulent activity, such as unauthorized transactions or requests for personal information.

The prevention of FinTech fraud requires a multi-faceted approach that includes effective identity verification processes, encryption and secure data storage methods, strong AML and KYC policies, collaboration with established financial institutions, and consumer education and awareness campaigns. Businesses operating in the FinTech sector can help to limit the possibility of fraud and guarantee the safety of their client's financial transactions by adopting these practices.

4.11 Cyber Security Threats in the European Financial Markets

Cybersecurity threats have become a major concern for financial markets in Europe. The financial sector is particularly attractive to cybercriminals, as it holds vast amounts of sensitive data and money. The heightened utilization of digital technologies and the expanding presence of financial technology (FinTech) firms have exacerbated the cyber security risks. As a result, the European Union (EU) has implemented several measures to address these challenges (Calliess & Baumgarten, 2020).

One of the most significant cyber security threats is the use of malware, which can infect computer systems and cause significant harm. Malware can steal sensitive data, including financial information, passwords, and personal identification numbers (PINs), and can also take control of computer systems, allowing cybercriminals to carry out unauthorized transactions. Ransomware is another form of malware that has become increasingly common in recent years, where attackers encrypt victims' data and demand payment in exchange for restoring access (Iris HY Chiu, 2016; Choi et al., 2019; Cull, 2022).

Phishing attacks are also a significant threat in Europe. To "phish" is to conduct an attempt at obtaining confidential information by pretending to be a trustworthy source. These attacks can be carried out via email, social media, or messaging apps and can trick users into giving away their personal information.

In addition, distributed denial-of-service (DDoS) attacks pose a significant threat to financial institutions in Europe. Such attacks overwhelm servers with traffic, causing them to crash and resulting in service disruptions and financial losses. To counter these cyber security threats, the EU has taken several steps. For instance, the General Data Protection Regulation (GDPR) obligates firms to safeguard personal data and report data breaches promptly. The Network and Information Security (NIS) Directive requires companies to take measures to secure their networks and report significant cyber incidents.

The EU has also established the "European Banking Authority (EBA)", which is responsible for coordinating EU-wide banking supervision. The EBA works with national authorities to ensure that banks in the EU adhere to high cyber security standards.

The EU's Cyber security Act of 2019 established the "European Union Agency" for Cyber Security (ENISA), which is responsible for improving cyber security across the EU. ENISA works with EU institutions, member states, and the private sector to promote cyber security

standards and provide cyber security expertise (Markopoulou, Papakonstantinou, & De Hert, 2019).

In addition to these measures, financial institutions in Europe are also implementing their own cyber security measures. These measures include regular staff training on cyber security, implementation of security protocols, and the detection and avoidance of cyberattacks through the application of cutting-edge technology like AI and ML (Buchi et al., 2019).

In conclusion, cyber security threats in the European financial markets are a significant concern, and the EU has implemented several measures to address these challenges. Incorporation of the GDPR, NIS Directive, and establishment of the EBA and ENISA are all significant steps towards ensuring cyber security in the financial sector. Financial institutions are also implementing their own measures to prevent cyber threats.

4.12 FinTech Regulation and Compliance

FinTech has been revolutionizing the financial industry by providing innovative solutions that offer faster, more efficient, and cost-effective services to consumers. The global regulatory community is struggling to keep up with the rapid development of FinTech. FinTech businesses operate in a regulatory grey area that falls between traditional financial services and technology companies. This can lead to regulatory gaps that threaten consumer protection and the economy's stability. Hence, there is a need for regulatory bodies to develop and implement guidelines that will ensure the safety and security of consumers.

However, this rapid growth has also brought about numerous challenges, particularly in terms of regulation and compliance. FinTech regulation is a complex issue that requires a balance between innovation and stability. Different nations have distinct regulatory environments, and it can be difficult for authorities to strike a balance between fostering innovation and protecting consumers and the economy. FinTech has brought tremendous advancements in the financial industry, but it also poses a significant risk to the stability and security of financial markets. To mitigate these risks, governments and regulatory bodies across the world have developed various regulations to govern FinTech operations (Anielak, 2019; Arslanian et al., 2019). FinTech regulation and compliance have become crucial as the region continues to experience growth in the FinTech industry (Haqqi, 2020).

One of the major challenges facing FinTech regulation is the lack of harmonization among different countries. Every country has its unique set of rules and regulations that can be confusing for FinTech companies that operate across borders. This inconsistency can result in compliance issues and legal uncertainties, making it difficult for FinTech firms to expand their operations. Protecting consumers' data and privacy is one of the primary concerns for regulators. FinTech firms collect and process massive amounts of data, which can be utilized for various purposes. Therefore, verifying that these enterprises comply with data privacy laws is critical. In the EU, the General Data Protection Regulation (GDPR) has been implemented to ensure that all businesses, including FinTech firms, adhere to data protection regulations.

Furthermore, the provision of financial services often requires licenses, permits, and other regulatory approvals. FinTech companies that offer banking services or investment products, for instance, need to comply with financial regulations that require licenses and permits. These regulations ensure that only reputable and qualified companies offer financial services to consumers. In recent years, many countries have taken steps to improve their FinTech regulation and compliance frameworks. For example, Singapore has established the Monetary Authority of Singapore (MAS), which regulates all financial services in the country; the Monetary Authority of Singapore (MAS) has taken various initiatives to bolster the growth of FinTech firms. These include the regulatory sandbox, which enables FinTech businesses to test their products and services in a controlled environment.

In Hong Kong, the Securities and Futures Commission (SFC) has developed a regulatory framework for virtual asset trading platforms. This framework necessitates that these platforms must be licensed by the SFC and comply with anti-money laundering and counter-terrorist financing requirements. The framework also comprises measures to safeguard investor interests, such as mandatory disclosure of key product features and risks.

China has also implemented various regulations to oversee FinTech operations. The People's Bank of China (PBOC) has created a regulatory framework for payment systems, which requires payment service providers to obtain licenses and adhere to a range of requirements, including risk management and anti-money laundering measures.

The country has also introduced regulations to govern online lending platforms, which require these platforms to obtain licenses and comply with lending limits and disclosure requirements.

However, despite these efforts, FinTech regulation and compliance in still face several challenges. One of the main challenges is the lack of resources and expertise among regulatory bodies, which can lead to delays in the development of new regulations and difficulty in enforcing existing regulations. Another challenge is the fast pace of technological innovation in the FinTech industry, which can make it difficult for regulators to keep up with the latest developments.

FinTech regulation and compliance are crucial to the stability and security of financial markets. While many countries have taken steps to improve their regulatory frameworks, there is still a need for greater harmonization and collaboration among different countries to create a more cohesive and effective regulatory environment. Regulators must keep up with the rapid changes in the FinTech business and adopt a preventative stance toward mitigating the risks associated with FinTech if they are to effectively oversee the sector.

FinTech regulation and compliance in has been evolving rapidly in response to the dynamic nature of the industry. The United States has taken a somewhat decentralized approach to FinTech regulation, with different regulatory bodies overseeing different aspects of the industry (Herrera & Vadillo, 2018).

One of the key regulatory bodies in the US is the “Consumer Financial Protection Bureau (CFPB)”, which was formulated in 2010 to safeguard consumers from financial risk. The CFPB has been quite active in policing the financial technology firms that provide P2P lending and online payment services to consumers (Herrera & Vadillo, 2018).

Apart from the Consumer Financial Protection Bureau (CFPB), several other regulatory bodies supervise FinTech in the United States. These include the Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), and the Federal Trade Commission (FTC). Each of these agencies holds jurisdiction over various aspects of the industry, such as securities offerings, derivatives trading, and consumer protection.

One of the key challenges facing FinTech regulation in America is the patchwork of state and federal laws that govern the industry. Unlike some other countries, such as the UK, there is no unified regulatory framework for FinTech in the US. This has led to some confusion and uncertainty among FinTech companies, who must navigate a complex web of laws and regulations in order to operate.

To tackle this problem, some states in the US have started to devise their own regulatory frameworks for FinTech. For instance, in 2019, New York state introduced a licensing system for virtual currency firms operating within the state. Other states, such as Wyoming and Arizona, have also taken steps to create FinTech-friendly regulatory environments.

Overall, the regulatory landscape for FinTech in America is complex and rapidly evolving. FinTech companies must navigate a variety of federal and state laws and regulations in order to operate and must stay up to date on changes in the regulatory environment. As the FinTech industry continues to grow and evolve, it is likely that regulatory bodies will continue to adapt and refine their approaches to oversight and compliance.

4.13 FinTech Regulation and Compliance in Europe

“FinTech regulation and compliance in Europe” has been a topic of discussion for several years now. Consumer protection, financial stability, and market integrity are all concerns for regulators as FinTech continues to disrupt the traditional banking industry. This paragraph will examine the state of FinTech regulation and compliance in Europe (Tanda & Schena, 2019; Treleaven, 2015).

The European Union has played a significant part in regulating FinTech. In 2018, the European Commission unveiled its FinTech strategy, which presented a framework for building a more competitive and innovative financial industry in Europe while guaranteeing consumer protection and market integrity.

In order to help customers, distinguish between unregulated and regulated FinTech companies, the plan proposes a number of efforts, such as the formation of a single market for FinTech, the building of a regulatory sandbox for testing new goods and services, and the enactment of a European FinTech Labelling regime.

FinTech legislation in Europe is complex, combining rules from the national and EU levels. Due to the fact that it regulates how personal data is used by FinTech businesses, the EU's General Data Protection Regulation (GDPR) has had a significant impact on the industry. FinTech is also impacted by the EU's Markets in Financial Instruments Directive II (MiFID II) and Payment Services Directive II (PSD2) because they govern financial services and investments, respectively.

In addition to EU-level regulation, national regulators in Europe have been active in regulating FinTech. The UK's "Financial Conduct Authority (FCA)" has been a leader in FinTech regulation, launching its regulatory sandbox in 2016 and granting licenses to several FinTech firms. In order to help customers, distinguish between unregulated and regulated FinTech companies, the plan proposes a number of efforts, such as the formation of a single market for FinTech, the building of a regulatory sandbox for testing new goods and services, and the enactment of a European FinTech Labelling regime.

One of the challenges of regulating FinTech in Europe is the fragmented nature of the market. FinTech firms may operate in multiple countries and be subject to different regulatory regimes. To address this, the EU is working to create a single market for FinTech, which would allow firms to operate across the EU with a single set of regulations.

Another challenge is keeping up with the rapid pace of innovation in FinTech. To safeguard consumers and keep the economy stable, regulators must strike a balance with their desire to promote new ideas. Some have argued that overly strict regulation could stifle innovation in FinTech, while others argue that a lack of regulation could lead to increased risks for consumers and financial instability (Bernoth et al., 2017).

Regulation and compliance for the FinTech industry in Europe are intricate and dynamic. While the European Union (EU) has been at the forefront of FinTech regulation, national regulators have also been crucial. Staying up with the rapid pace of innovation and a dispersed market are two of the difficulties regulators face while attempting to oversee FinTech. Regulators have to maintain a balance between encouraging innovation and safeguarding consumers' interests, the financial system's stability, and the market's integrity as FinTech proceeds to expand and challenge traditional banking practices.

4.14 Analysis of Regulation and Compliance

Regulation and compliance are crucial aspects of the financial industry, including the rapidly growing FinTech sector. The increasing reliance on digital technology and data in FinTech has brought with it new risks and vulnerabilities, which require a robust regulatory framework to ensure consumer protection and financial stability. Indeed, analyzing the current state of regulation and compliance in the FinTech industry is crucial to ensure that companies operate in a legal and ethical manner while also protecting consumers' interests

and data privacy. As the industry continues to evolve and expand, it is essential for regulatory bodies to keep pace with the latest developments and to create a regulatory environment that fosters innovation while also maintaining stability and security in the financial system.

Regulatory infrastructure for financial technologies (FinTech) is still in its infancy in many nations, and there is a lack of clarity and consistency in the regulatory approach. This is partly due to the fact that FinTech companies often operate across borders, making it challenging to establish a uniform set of regulations. Additionally, FinTech innovations are evolving at a rapid pace, which makes it difficult for regulators to keep up with the changing landscape. This has resulted in a regulatory environment that is complex and fragmented, creating compliance challenges for FinTech companies.

One of the main challenges facing FinTech companies is navigating the regulatory landscape, which can vary significantly between jurisdictions. In Europe, for example, the regulatory approach to FinTech varies across member states, with some countries taking a more permissive approach while others have stricter regulations. This creates a compliance burden for FinTech companies operating across the region. In the US, there are different regulatory bodies responsible for overseeing different aspects of the financial industry, which can lead to confusion and inconsistency in regulation (Arner et al., 2015; Bernoth et al., 2017; Iris HY Chiu, 2017; Cull, 2022).

Another challenge is the cost of compliance, which can be a significant burden for FinTech startups, particularly those with limited resources. Compliance costs can include regulatory fees, legal expenses, and the cost of implementing compliance systems and processes. This can be particularly challenging for smaller FinTech companies, which may struggle to compete with larger incumbents who have established compliance infrastructure (Bhandari, 2021; A. Boot et al., 2021).

The complexity of the regulatory landscape and the cost of compliance can create barriers to entry for new FinTech companies, which may limit competition and innovation in the sector. This could have negative implications for consumers, who may miss out on the benefits of FinTech innovation if competition is restricted.

In order to address these challenges, regulators and policymakers need to work with the FinTech industry to establish a clear and consistent regulatory framework. In order to guarantee consumer safety and financial stability, this should be accomplished through a

concerted effort that bears into account the specifics of the FinTech industry (Alekseenko, 2022).

The creation of regulatory sandboxes, in which FinTech firms can experiment with new goods and services without being penalized for violating existing rules, is one possible response. This can help to reduce compliance costs and provide regulators with valuable insights into the risks and opportunities associated with FinTech innovation.

Another approach is the establishment of international regulatory standards for FinTech, which could help to create a more uniform regulatory environment across jurisdictions. This has the potential to lessen the burden of regulatory compliance for internationally active FinTech firms without compromising customer security or market stability.

The regulation and compliance of FinTech is a complex and evolving landscape which requires a collaborative and innovative approach from regulators, policymakers, and the FinTech industry. While there are significant challenges associated with regulation and compliance, there are also opportunities to create a regulatory framework that supports innovation and competition while ensuring that consumers are protected, and financial stability is maintained. By working together, regulators and the FinTech industry can develop a regulatory environment that promotes the growth and development of the FinTech sector while ensuring that the risks and vulnerabilities associated with FinTech are effectively managed.

The introduction of new and exciting FinTech goods and services has revolutionized the banking industry. Concerns about the regulation and compliance of these new financial goods and services have emerged, however, as FinTech has expanded rapidly. To safeguard customers, keep the financial system stable, spur innovation, and level the playing field, proper FinTech regulation and compliance are essential (A. Boot et al., 2021) (Branzoli & Supino, 2020).

In Europe, FinTech regulation and compliance have been at the forefront of policy discussions.

In America, FinTech regulation and compliance have been primarily focused on the state level, with the “Federal Reserve and the Office of the Comptroller of the Currency (OCC)” issuing guidance and regulations for FinTech companies. The OCC has introduced a FinTech charter, which allows FinTech companies to operate as special-purpose national banks.

However, this charter has faced legal challenges, and there is an ongoing debate about its applicability to different types of FinTech companies (Arslanian et al., 2019).

FinTech regulation in the United States is complicated by the wide variation in state laws, which can lead to regulatory fragmentation and uncertainty for FinTech companies. To address this challenge, there have been calls for a federal FinTech regulatory framework which can provide consistency and clarity for FinTech companies and regulators.

In Asia, FinTech regulation and compliance vary widely across different countries. Some countries, such as Singapore and Hong Kong, have implemented regulatory sandboxes to encourage innovation and collaboration between FinTech companies and regulators. Other countries, such as China, have taken a more restrictive approach to FinTech regulation, with the government imposing stricter licensing and supervision requirements for FinTech companies.

FinTech regulation presents a number of unique issues in Asia, such as the diversity of legal systems and cultural norms across the region (Arner et al., 2015). To address this challenge, there have been efforts to promote regulatory cooperation and harmonization between the different countries. For example, the ASEAN Economic Community has established a framework for FinTech regulation and cooperation across the member states (Arner et al., 2020).

In conclusion, FinTech regulation and compliance are essential to ensure the safety and protection of consumers, maintain the stability of the financial system, and promote innovation and competition. There are several challenges to regulating FinTech, such as the diverse regulatory landscape, the patchwork of state-level regulations, and the diversity of legal systems and cultural norms. To address these challenges, there is a need for a harmonized approach to FinTech regulation, regulatory sandboxes, and innovation hubs, federal FinTech regulatory frameworks, and regulatory cooperation and harmonization between countries. These measures can help to ensure that FinTech continues to drive innovation and growth in the financial sector while safeguarding the interests of consumers and maintaining financial stability.

Chapter – 5 Analysis of two Case Studies in Europe

5.1 Case Study 1: Revolut and the Policy Implications of Financial Technology in Europe

Revolut is a United Kingdom-based financial technology company that offers a variety of services to its consumers. These services include banking, currency exchange, and cryptocurrency trading. The company has made a stir in Europe's traditional banking industry by offering consumers cheap costs, a user-friendly mobile application, and a vast array of cutting-edge services. This case study will analyze the consequences of Revolut's business model for policymakers in Europe, as well as the challenges posed by this strategy to regional authorities.

The business strategy applied by Revolut enables low prices for a variety of services, which is one of the company's key advantages. As a result, it has become especially attractive to consumers who are interested in reducing the amount of money they spend on banking and foreign exchange needs. For instance, Revolut does not charge any fees for transacting in foreign currencies, nor does it charge any fees for withdrawing money from ATMs up to a certain limit. Because of this, traditional banks are under more pressure to decrease their expenses and are required to adapt to the changing market conditions.

However, Revolut's business model presents European authorities with a lot of difficulties to tackle. The lack of regulation in the bitcoin business is one of the greatest causes for concern. Users of Revolut can conduct transactions using cryptocurrencies such as Bitcoin and Ethereum, which are not currently subject to the same regulatory framework as conventional currencies. As a result of these developments, there are worries about the possibility of illicit activities such as money laundering.

There is also the risk that Revolut will become too successful to fail in the future. As the company continues to expand and establish its position in the European market, there is a likelihood that it will become a possible systemic risk to the European financial system. This would compel the participation of regulatory authorities in the event of a crisis, which may potentially salvage the enterprise.

Despite these limitations, Revolut has proved that there is a significant demand in Europe for innovative financial technology services. The company has successfully attracted the attention of millions of users and has earned billions of dollars in funding. In addition, it has

driven traditional financial institutions to adapt to the changing market conditions and invest in the digital capabilities of their own companies.

In conclusion, the Revolut case study gives light on the effects of financial technology on the European policymaking process. Although there are significant benefits to the unique business models offered by companies like Revolut, regulators must also address some problems. Regulators must address these difficulties because they must be resolved. As the financial technology industry continues to undergo rapid development, it will be vital for regulators to strike a balance between supporting innovation and safeguarding customers and the financial system.

5.2 Case Study 2: N26 and the Challenges of Scaling in the European Market

N26 is a German-based financial technology start-up that provides digital banking services to users throughout Europe. Since its inception in 2015, the company has experienced accelerated growth due to the widespread adoption of its user-friendly design and various tempting features, such as fee-free domestic and international money transfers and real-time notifications of spending. As it endeavoured to develop its operations and expand into new locations, the company experienced a number of challenges and obstacles.

Compliance with regulations was one of the most important challenges faced by N26. As a digital bank, N26 was obligated to comply with the laws of each European nation in which it conducted business. It was difficult for the business to ensure compliance while still providing a smooth user experience because the legislation and standards for compliance differed from country to country. Furthermore, the organization was obliged to adhere to the Payment Services Directive (PSD2) introduced by the European Union. The primary aims of this directive were to promote competition and advancement in the payment services industry while also protecting the confidentiality of customer data. N26 also had difficulty recruiting new consumers and retaining existing ones. The tremendously competitive market made it difficult for the company to retain its consumers, despite its success in attracting customers through its appealing features and marketing operations. Customers were able to transfer providers rapidly due to competition from both major financial institutions and emerging FinTech firms. In order to distinguish itself from the competition and retain its customers, N26 needs to continuously improve the quality of its services and offer exclusive features.

When attempting to scale its platform, N26 ultimately found certain technical challenges. As it continued to grow and acquire new customers, the company had to ensure that its platform could accommodate the increasing demand and volume of traffic. The company was required to invest in its infrastructure and technology to ensure the platform's stability and capacity to conduct a large volume of transactions.

N26 took a variety of measures to resolve the challenges it was experiencing. The organization worked together with the relevant authorities to achieve compliance while maintaining a positive client experience. In order to retain more consumers and distinguish itself from its competitors, N26 invested in its customer service and offered new choices, such as insurance and investment products.

In addition, N26 has made substantial investments in its technology infrastructure to ensure that its platform can handle the increased demand. As the business grew, it developed a flexible cloud-based platform that could be readily expanded and adapted to new scenarios. Due to this, N26 was able to execute a high volume of transactions while maintaining its platform's dependability and security.

N26 has achieved considerable success in the European market despite the obstacles it has had to face. The company currently serves over 7 million customers in 25 European countries and has successfully raised over \$800 million in cash. On the other hand, the challenges it encountered illustrate the constraints of growth in the extremely competitive European FinTech market. To ensure that their products are scalable and reliable, companies interested in entering this business must be prepared to deal with complex laws, compete with current competitors, and make substantial expenditures in technology and infrastructure.

The N26 case study illustrates the challenges that FinTech companies face when attempting to develop and function in the European market. To ensure scalability and reliability, the company was necessary to manage complex rules, compete against well-established banks and other FinTech companies, and make substantial investments in technology and infrastructure. Despite these challenges, N26 has been successful in recruiting new customers and retaining existing ones, emerging as one of the most successful digital banks in Europe.

5.3 Comparative Studies between Revolut and N26

Revolut and N26 are regarded as two of Europe's most successful and fast-expanding FinTech companies. Both of these organisations provide digital banking solutions and have been successful in attracting customers due to their innovative goods and services. Let's examine in greater detail the business strategies employed by each organisation in the FinTech industry, as well as their respective success stories.

5.3.1 Revolut

Revolut was founded in 2015 with the purpose of overturning the current banking system. The company offers users a variety of financial services, including a mobile banking application, a prepaid debit card, and currency exchange services. The app's affordable prices, user-friendly interface, and cutting-edge features have all contributed to the company's success in attracting new customers. In addition, the company has expanded its services to include the purchase and sale of cryptocurrencies, insurance, and personal loans.

Revolut's success can be attributed to a variety of different factors. The company's success in the foreign market can be due, in part, to the low fees it charges and the favourable exchange rates it offers. Second, Revolut's software is not only easy to use but also includes a wide range of cutting-edge features, such as the ability to purchase and sell cryptocurrencies. Last but not least, the company's attempts to expand its range of products and services, which currently includes personal loans and insurance, have been successful.

5.3.2 N26 Bank

N26 is a German financial technology business that was founded in 2013. Similar to its competitor Revolut, N26 offers consumers a number of banking options, including a mobile banking app and a prepaid debit card. The company's user-friendly software and reasonable rates have been effective in attracting new customers. In addition, N26 enables access to a variety of cutting-edge features, such as the ability to make quick money transfers and block and unblock your card with a single tap.

Many things have contributed to N26's prosperity. To begin with, the company's app is popular among tech-savvy millennials due to its affordability and user-friendliness. Second, in order to differentiate itself from conventional banks, N26 has been able to utilise its cutting-edge features, such as fast money transfers. Last but not least, N26's efforts to expand its offerings to include investing and insurance products have been fruitful.

5.3.3 Comparison of Differences

Revolut and N26 have both been able to successfully disrupt the status quo in the conventional banking business with their innovative products and services. Both of these organisations offer mobile banking applications and prepaid debit cards, all of which have competitive exchange rates and low prices. Both companies give their consumers a variety of cutting-edge choices, such as the ability to buy and sell cryptocurrencies and conduct quick monetary transactions.

However, there are also significant differences between the two businesses. Recently, Revolut has expanded its services to include additional products and services, including insurance and personal loans, in a more proactive manner. In comparison to N26, Revolut gives consumers access to a broader selection of options for trading cryptocurrency. N26, on the other hand, has a stronger presence in Europe and has successfully attracted tech-savvy millennials to its platform with the straightforward design of its mobile application and the distinctive features it offers.

With more than 15 million customers worldwide, Revolut has a larger customer base than N26 and hence a larger market share. N26, on the other hand, is expanding rapidly and currently serves over 7 million customers throughout Europe.

With the introduction of their cutting-edge products and services, both Revolut and N26 have successfully disrupted the traditional banking market. N26 has a larger presence in Europe and has attracted technologically savvy millennials more effectively than Revolut, which has expanded its service offerings more aggressively. Both companies have eventually demonstrated that there is a growing demand for low-cost, innovative, and user-friendly digital banking solutions.

Chapter – 6 Conclusion

6.1 Future of FinTech in Europe

As technology continues to drive innovation across industries, Europe's FinTech sector is gearing up for significant growth in the coming years. The financial technology (FinTech) industry has the ability to disrupt the established financial services sector in Europe, with widespread positive effects for customers, companies, and the financial sector as a whole (Kapsis, 2020b).

The FinTech industry has been growing significantly over the past few years, with Europe, in particular, emerging as one of the major hubs for FinTech startups. According to a report by Accenture, Europe's FinTech investment grew by 29% in 2019, with total investment reaching \$58 billion over the past five years and more than \$12 billion in 2019 alone. The expansion of the FinTech industry is anticipated to persist in the upcoming years, influenced by numerous factors (Naz et al., 2022a).

The rising use of smartphones for banking and electronic payment methods is a major factor in the development of Europe's FinTech sector (Stulz, 2019). As consumers become more comfortable using digital channels for banking and payments, traditional banks are under pressure to digitize their offerings and provide more user-friendly, convenient services. FinTech firms have stepped in to fill this gap, offering innovative digital solutions that are often better suited to the needs of digitally - savvy consumers. Future years will likely see this pattern persist, with further innovation expected in the areas of mobile banking, digital wallets, and payments (Holmes & King, 2019).

Another factor driving the growth of FinTech in Europe is the increasing focus on regulatory compliance. Since the global financial crisis, regulators across Europe have become more stringent in their requirements for financial institutions, particularly in the areas of risk management and customer protection (Arner, Barberis, & Buckley, 2017). FinTech firms are often more nimble and agile compared to traditional banks, making them better suited to stay on top of changing regulatory requirements. The rise of FinTech has resulted in a surge of investment in the industry, particularly in companies that provide compliance technology like anti-money laundering (AML) and Know Your Customer (KYC) solutions (A. W. Boot, 2017).

In addition, the worldwide outbreak of COVID-19 has sped up the transition to digital financial services, with customers preferring contactless solutions to traditional banking and payments (Arner et al., 2017). The pandemic has also highlighted the need for digital financial inclusion, particularly for the underserved and unbanked segments of the population. FinTech firms are well-positioned to fill this gap, providing innovative solutions that can make banking and payments more accessible and convenient. This shift in consumer behaviour is expected to be long-lasting, driving further growth in the FinTech industry in the coming years.

In addition to these factors, several other trends are likely to shape the future of the FinTech industry in Europe. Particularly notable is the expanding application of AI and ML to the banking and insurance industries. Everything from managing risks and identification of fraud to client service and goods development stand to benefit from these technological advancements in the banking sector (Mention, 2019). FinTech firms are at the forefront of this trend, with many developing “AI-powered solutions” that can help financial institutions streamline their operations and improve the customer experience (Legowo, Subanidja, & Sorongan, 2021).

Another trend that is likely to shape the future of FinTech in Europe is the increasing focus on sustainability and responsible investing. With climate change and other environmental issues become more pressing concerns, investors are increasingly looking for ways to invest their money in sustainable projects and companies (Fadhul & Hamdan, 2020). FinTech firms are responding to this trend by developing platforms and solutions that enable responsible investing, such as impact investing, green bonds, and sustainable investing. This trend is likely to continue in the future, driving further investment in FinTech solutions that can help address environmental and social challenges (P. Gomber, J.-A. Koch, & M. Siering, 2017).

Finally, the increasing use of blockchain technology is another trend that is likely to shape the future of FinTech in Europe. Blockchain, a distributed ledger technology that enables secure transactions without the need for intermediaries, has the potential to transform many aspects of financial services, from payments and settlements to securities trading and supply chain finance (Vasiljeva & Lukanova, 2016). FinTech companies are actively developing blockchain-based solutions for various applications, indicating that this technology is likely to become more prevalent in the coming years. Furthermore, there has been a significant increase in investment in FinTech, with some firms specializing in compliance technology,

such as anti-money laundering (AML) and Know Your Customer (KYC) solutions. As a result, the future of FinTech in Europe appears to be promising, with substantial growth anticipated in the next few years.

FinTech firms are well-positioned to capitalize on the shifting consumer behaviour, changing regulatory environment, and evolving technology trends to provide innovative solutions that can transform financial services and benefit the economy, businesses, and Customers as a whole (P. Gomber, J.-A. Koch, & M. J. J. o. B. E. Siering, 2017). As the FinTech industry continues to evolve, it is likely to gain an increasingly important role in the broader financial ecosystem, driving further innovation and growth across Europe.

6.2 Discussion and Analysis

The advent of financial technology, often known as FinTech, has brought about significant modifications in the financial services industry. These changes have included the disruption of old business models and the introduction of brand-new, cutting-edge goods and services. In the past, the financial services sector was heavily regulated, with rules and guidelines designed to maintain stability and protect consumers. However, the emergence of FinTech has created challenges for regulatory authorities, who must balance the need for innovation and competition with the need for safety and protection. In this Dissertation, the importance of FinTech regulation and compliance will be examined, highlighting their role in maintaining consumer safety and financial system stability, as well as promoting innovation and competition.

6.2.1 Consumer Safety

The safety and protection of consumers are among the primary objectives of FinTech regulation and compliance. One of the main risks associated with FinTech is the potential for fraud, as new technology and platforms provide criminals with new ways to scam consumers. For example, peer-to-peer (P2P) lending platforms may attract consumers who are unable to secure loans from traditional sources, but these platforms may also attract fraudsters who seek to exploit vulnerable borrowers. Regulatory authorities have implemented various requirements to address the risks associated with financial technology (FinTech), including Know Your Customer (KYC) and Anti-Money Laundering (AML) regulations, which aim to verify customers' identities and prevent fraudulent activities.

Another key issue for consumer safety is data security. FinTech platforms process large amounts of personal and financial information, which must be protected from cyber security threats. Cyber-attacks on FinTech companies can result in the theft of customer data, which can be used to commit fraud or identity theft. As a result, organizations are required by legislation and compliance in the FinTech industry to install stringent cyber security measures such as cryptography and multi-factor authentication in order to safeguard consumer data from being accessed by unauthorized parties and cyber-attacks.

6.2.2 Financial System Stability

Regulation and compliance are crucial to maintaining the soundness and stability of the financial system, particularly in the context of financial technology. Regulatory oversight helps to ensure that FinTech companies operate in a safe and secure manner and are held accountable for their actions. Compliance with applicable regulations, such as those related to KYC and AML, is also essential to prevent fraud and other illegal activities that could undermine the integrity of the financial system. Ultimately, effective regulation and compliance are key to promoting innovation and growth in the FinTech industry while maintaining the safety and security of the financial system.

The economic instability that occurred in 2008 served as a vivid illustration of the linked nature of the financial system as well as the capacity of systemic risks to endanger the viability of the economy. The introduction of new FinTech could expose the financial system to unanticipated dangers, such as the possibility of quick contagion spread through interconnected platforms, the susceptibility of digital assets to cyberattacks, or the sensitivity of the market to price swings. Therefore, regulatory authorities have a responsibility to ensure that financial technology businesses conduct their business in a secure and reliable manner, adhering to the same norms of risk management and prudential supervision as traditional financial institutions.

One area of particular concern for FinTech regulation is the emergence of cryptocurrencies and blockchain technology. Cryptocurrencies operate outside of traditional financial systems, and their use raises concerns about the potential for illicit activities such as money laundering and terrorist financing. Furthermore, the volatility of cryptocurrency prices may also create instability in financial markets. Therefore, regulatory authorities must strike a balance between the need to promote innovation and the need to maintain the financial system

stability and develop appropriate regulatory frameworks to address the unique characteristics of cryptocurrencies and blockchain technology.

6.2.3 Innovation and Competition

The regulation and compliance of FinTech are crucial for balancing the benefits of innovation with the need for financial stability and consumer protection. The growth of FinTech can enhance competition in the financial services industry, providing consumers with more choices and cost-effective services, such as P2P lending and robo-advisors, as well as mobile payment systems that offer more convenient payment options. However, as with any innovative sector, regulatory gaps and uncertainties may arise, which can hinder the growth of FinTech. Such uncertainties may cause delays in the deployment of new products and services, placing FinTech startups at a disadvantage in comparison to traditional financial institutions.

Therefore, regulatory authorities must develop flexible regulatory frameworks that balance the need for innovation and competition with the need for consumer protection and financial stability. The advent of financial technology, often known as FinTech, has brought about substantial modifications in the financial services industry. These changes have included the disruption of old business models and the introduction of brand-new, cutting-edge goods and services. In the past, the financial services sector was heavily regulated, with rules and guidelines designed to maintain stability and protect consumers. However, the emergence of FinTech has created challenges for regulatory authorities, who must balance the need for innovation and competition with the need for safety and protection. This Dissertation will examine why FinTech regulation and compliance are essential for maintaining consumer safety and financial system stability, as well as promoting innovation and competition.

6.3 Limitations

There are several limitations associated with this study, including:

6.3.1 Reliance on Secondary Data Sources

The study relies on secondary data sources, such as academic journals, industry reports, and government statistics. This means that the researchers did not collect their own data, which may limit the scope and quality of the study.

6.3.2 Limited Scope

The study focuses on FinTech in Europe, which may not be representative of the global FinTech landscape. Additionally, the study may not capture the experiences of smaller FinTech start-ups or firms operating in niche markets.

6.3.3 Potential for Bias

The researchers may have a bias towards certain data sources or analytical methods, which may skew the findings and conclusions. Additionally, the researchers' prior knowledge and experience in the field may influence their analysis and interpretation of the data.

6.3.4 Lack of Contextual Information

The study may not provide sufficient contextual information about the FinTech industry in Europe. This could limit the understanding of the factors driving growth and innovation in the industry, as well as the challenges faced by FinTech firms.

6.4 Further Scope

The scope of study in FinTech regulation and compliance is vast, and there are several areas that require further research and analysis. Some of the key areas that researchers and regulatory authorities can focus on are:

How Traditional Financial Institutions are being affected by FinTech: As a result of the proliferation of FinTech, conventional financial institutions are confronted with a major increase in the difficulty of preserving their market share. Researchers have the opportunity to investigate the effects that FinTech has had on the profitability and viability of traditional financial institutions, as well as the possible hazards and opportunities that are associated with the disruption that FinTech has caused.

The Regulation of Emerging FinTech Products and Services: As new FinTech products and services emerge, there is a need for regulatory authorities to develop appropriate regulatory frameworks to ensure consumer protection and financial stability. Researchers can analyse the regulatory challenges associated with emerging FinTech products and services and propose solutions for addressing these challenges.

The Role of Data Protection and Cyber Security in FinTech Regulation: FinTech relies heavily on data, and there are growing concerns about the privacy and security of consumer data. Researchers can explore the role of data protection and cyber security in FinTech

regulation and propose best practices for ensuring the security and protection of consumer data.

The Development of Global Standards for FinTech Regulation: FinTech is a global phenomenon, and there is a need for global standards and cooperation in FinTech regulation. Researchers can analyze the challenges associated with developing global standards for FinTech regulation and propose strategies for achieving this objective.

The impact of regulatory sandboxes on FinTech innovation: Regulatory sandboxes are becoming increasingly popular as a means of promoting FinTech innovation while ensuring regulatory compliance. Researchers can analyze the impact of regulatory sandboxes on FinTech innovation and identify best practices for implementing and managing regulatory sandboxes.

The role of FinTech in promoting financial inclusion: FinTech has the potential to improve financial inclusion by making financial services more affordable and accessible to underserved populations. Researchers can examine how FinTech is currently impacting financial inclusion and propose strategies for increasing FinTech adoption among underserved communities. This can include studying the barriers to adoption, such as lack of access to technology or financial education, and developing solutions to overcome these barriers. Additionally, research can focus on the impact of FinTech on specific underserved groups, such as low-income households, small business owners, and rural communities, and identify ways to tailor FinTech solutions to their unique needs. Ultimately, promoting FinTech adoption in underserved communities can help reduce economic inequality and improve financial well-being for all.

The Impact of FinTech on Financial Stability: FinTech has the potential to promote innovation and competition in the financial sector, but it also poses risks to financial stability and consumer protection. Therefore, there is a need for appropriate regulatory frameworks to balance innovation with consumer protection and financial stability.

Future research can explore the impact of FinTech on financial inclusion and stability and propose strategies for promoting FinTech adoption in underserved communities while addressing the potential risks. Overall, the evolution of FinTech will play a crucial role in shaping the future of the financial sector, and researchers and regulatory authorities must work together to address the challenges and promote the growth of the industry.

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