An overview of financial technology sector in Turkey

Yunus KARAÖMER[1]
Res.Asst.,Dr., Department of Business Administration, FEAS,
Hatay Mustafa Kemal University, Turkey
yunuskaraomer@mku.edu.tr, 0000-0002-6377-1326

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Abstract: The rapid developments in technology and digital transformation in the recent period cause radical changes in social life and the business world. FinTech, which emerged with its influence in digital transformation, is one of the most popular topics of the last period with the innovative solutions it provides. FinTech, which was established to change and improve the technological background of consumers and financial institutions in the first place, is defined as a technological innovation that aims to strengthen competition with financial methods. In today's world, where the competitive conditions are changing rapidly, companies are in an effort to reshape their services regardless of the sector. This process, mainly driven by competition and consumer demands, requires companies to produce faster and safer solutions. This study attempt to evaluate an overview of Financial Technology Sector in Turkey. Besides, in this study, information is given about the term FinTech, its historical process, and its ecosystem.

Keywords: FinTech, FinTech Ecosystem, Turkey

JEL Code: B26, G29.

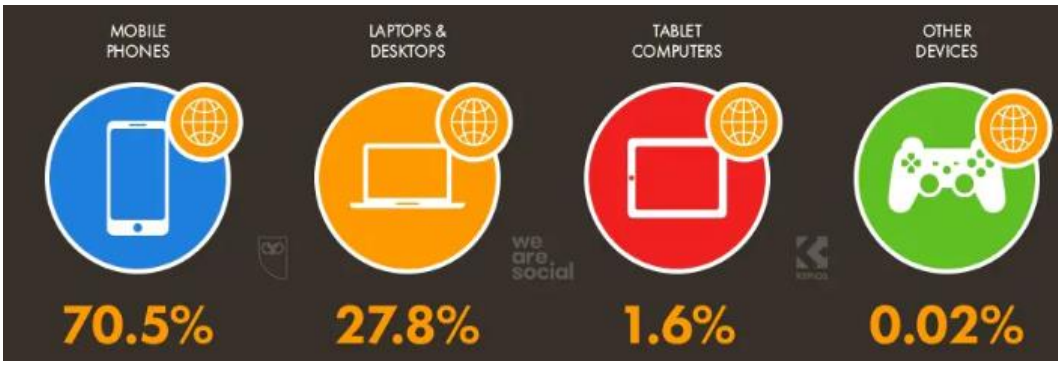
1. Introduction

Consumers expect to receive fun, fast, and user-friendly financial services recently that can easily be accessed from anywhere. In order to meet all these expectations, studies and competition in the field of FinTech are increasing day by day in Turkey as well as the rest of the world. FinTech is the combination of finance, and technology to provide better, faster and easier financial services. In other words, it is providing new ways for consumers to access financial services by making financial services more user-friendly. The main factors that have brought FinTech to the agenda in recent years are the rapid increase in internet usage and mobile applications (E-Donusum Ofisi, 2021). Digital (2021) reports that as of January 2021, with an increase of 3.7 million (6%) compared to the previous year, 77.7% of Turkey's population has internet access, and 94.5% of this has mobile internet.

The young population is the main factor that facilitates the adaptation of society to technological developments and creates potential in this direction. According to the Digital 2021 Report; Turkey has a population of 84.69 million as of January 2021 and the median age of the population is 31.7 (Digital, 2021: 15). According to TUİK 2020 data, 38.23% of Turkey's population is under the age of 24 (TUİK, 2021). When the population size and age distribution of Turkey are compared, it is seen that Turkey has a younger and wider population base than the US and European averages (Digital, 2021: 17). As of January 2021, it has been determined that 77.7% of Turkey's population has internet access and 94.5% of Turkey's population has mobile internet (Digital, 2021: 24).

[1] Correspondence author. Hatay Mustafa Kemal University, Hatay, Turkey, yunuskaraomer@mku.edu.tr

Figure 1: Turkey device ownership data



Source: Digital, 2021: 28.

Figure 1 indicates device ownership data of internet users between the ages of 6-64 in Turkey. As of the 2021 year, 70.5% of internet users have a mobile phone; 27.8% of internet users have a laptop or desktop; 1.6% of internet users have a tablet; 0.02% of internet users have other tools (Digital, 2021: 28).

In the future years, in parallel with the development of technology, FinTechs are expected to play a more active role in our lives. The importance of meeting the changing needs of people with the advancing technology in the world of finance will increase in direct proportion to the contribution of technology to the finance sector and the importance of catching the financial competitive environment at world standards becomes evident (Genc, 2021: 1). This study attempt to evaluate an overview of FinTech Sector in Turkey. Besides, in this study, information is given about the term FinTech, its historical process, and its ecosystem. Thus, this study will provide readers or researchers with an overview of the latest developments in the Fintech sector in Turkey, and it would fill a gap in FinTech literature in Turkey.

The rest of this study is organized as follows: Section 2 introduces the literature review, section 3 is an overview of FinTech in Turkey. Finally, section 4 is the conclusion.

2. Literature Review

2.1. Financial Technology

About 62% of the world's population does not use traditional banking services either to borrow or use their savings. About 38% do not even have a bank account. Banks do not seem enthusiastic to serve this segment due to high compliance and infrastructure costs. However, providing financial services to this segment, which is far from the traditional banking system, will add depth and inclusiveness to financial markets. It is stated that this can make significant contributions to global development (Lee and Low, 2018: 259).

After the 2008 Global Financial Crisis, consumers' trust in banks have decreased. Thus, banks has started to establish relationships with innovation-oriented FinTech initiatives in order to gain the trust of consumers in banks and increase consumer satisfaction. As a result, an opportunity has arisen for FinTech companies as banks understand that welcoming innovation and building relationships with startups can help increase customer satisfaction and provide the competitive edge they need to minimize financial and regulatory constraints (Belli, 2016: 21).

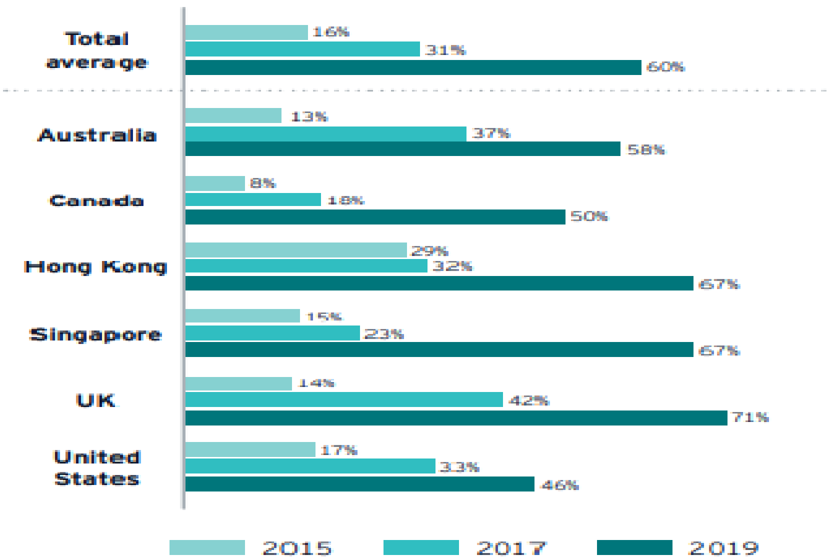
The term "FinTech" (sometimes: Fin-tech or Fintech) derives from the words "financial" and "technology" and is generally modern and mainly associated with the established business activities of the financial services industry (e.g. money lending, transaction banking) related technologies (e.g. cloud computing, mobile internet). Typically, FinTech refers to innovators and disruptors in the financial industry, especially those in the financial sector who exploit the availability of ubiquitous communication through the internet and automated information processing. Such companies have new business models that promise greater flexibility, security, efficiency, and opportunities than established financial services (Gomber et al, 2017: 541).

FinTech is a technological innovation that aims to compete with financial methods. It is an example of technology to enable the use of mobile devices for mobile banking and investment, and to enable people to access financial services much more easily. FinTech is also called the financial technologies portal that defines the financial services sectors emerging in the 21st century. It was originally applied to enhance the technological backgrounds of consumer and commercial finance institutions. Financial literacy and education have expanded to include technological innovations in the financial sector, including retail banking, investment, and even cryptocurrencies like bitcoin (Akkan, 2018: 2).

FinTechs, which benefit from information and communication technologies in financial services, have started to include the segment that does not have a strong relationship with traditional banking, along with their innovative business models, into the financial system (Komurcuoglu and Akyazi, 2020: 37).

Ernst and Young (EY) conducted a study on the “Global FinTech Adaptation Index” in 2019 (see Graph 1). A similar study was conducted in 2015 and 2017 by EY. The EY interviewed more than 27,000 consumers in 27 markets from 6 countries. As a matter of fact, according to the 2019 data of the global FinTech Adaptation Index, while the adaptation to FinTech services among consumers around the world was 16% in 2015, this rate increased to 31% in 2017 and finally to 60% in 2019. When the FinTech adoption index of six countries is compared, the highest increase is in the UK (EY, 2019: 6).

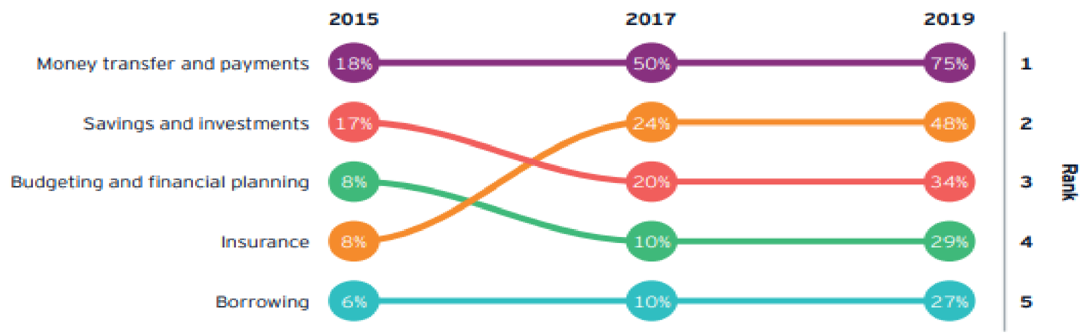
Graph 1: Comparison of FinTech adoption in six countries



Source: EY, 2019: 8.

Figure 2 indicates consumer FinTech adoption rates globally from 2015 to 2019, by category. It indicates the average percentage of respondents who reported using one or more FinTech services in that category. As seen in Figure 2, the most common category is money transfers and payments, with 75% of consumers using at least one service in this category. The most frequently used services in this category are peer-to-peer (P2P) payments, non-bank money transfers, and in-store mobile payments. Insurance adoption has seen significant growth from 8% in 2015 to almost 50% in 2019. Here, non-financial services organizations often facilitate consumer FinTech adoption, such as equipping cars with “black boxes” to provide data for telematics insurance or providing apps on mobile phones that consumers can use to count steps and gain fitness discounts on their health insurance. Saving and investment adoption has seen significant growth from 17% in 2015 to 34% in 2019 (EY, 2019: 10).

Figure 2: Consumer FinTech adoption rates globally from 2015 to 2019, by category



Source: EY, 2019: 10.

2.2. Financial Technology History

Although there is no clarity on when the term FinTech, which basically refers to the use of technology to provide financial solutions, began to be used, the term is generally attributed to the "Financial Services Technological Consortium" project initiated by Citigroup in the early 1990s to facilitate technological collaboration efforts (Arner et al., 2016: 3). Arner et al. (2016) has been examined three phases in the historical process of the coexistence of finance and technology: FinTech 1.0, FinTech 2.0, FinTech 3.0, and FinTech 3.5.

The evolution of financial technology has been developing for a long time and can be summarized with some examples as shown in Table 1. The first generation is known as "FinTech 1.0" which began around the 1866s (Abdillah, 2019: 10).

Table 1: FinTech evolution

Generation	Period	Notes	Products/Applications
FinTech 1.0	1866-1987	From analog to digital	- Transatlantic cable - Cable Phone
FinTech 2.0	1987-2008	Development of Traditional Digital Financial Services	- Credit Cards - ATM - Electronic Stock Trading - Bank Mainframe Computer
FinTech 3.0 FinTech 3.5	2008 – Present	Democratizing Digital Financial Services Emerging Market	- Startups - Payment Apps - Mobile Wallets - Blockchain - Cryptocurrency

Source: Abdillah, 2019: 11.

2.2.1. FinTnech 1.0 Era (1867 – 1967)

The invention of the printing press, which allowed countries to print paper money, was one of the proofs of the first emergence of financial technology. In 1866, however, it more clearly demonstrated the existence of financial technology through the invention of the telegraph and the successful establishment of the first transatlantic cable line, a prelude to the globalization of the world financial system (Truong, 2016: 4).

FinTech 1.0 era, which refers to the period between 1866-1967, covers the transition period from analog applications to digital applications. During this period, technologies such as the laying of the transatlantic telegraph cable (from 1866 to 1913), the basic infrastructure that made possible an era of strong financial globalization, the telegraph in the late 19th century, railroads and steamships helped to establish financial connections across borders (Arner et al., 2016: 4-5).

One of the most important developments of the FinTech 1.0 period is the use of credit cards, which continues to be influential today. In 1950, the world's first credit card, which can be used instead of cash in different regions and activities, was issued by Diners Club (Berberoglu, 2018: 4).

The first era of FinTech 1.0 began when early financial globalization took place. It was marked by the first transatlantic cable connection between Europe and America from 1866 until Barclays Bank invented the first ATM Machine in 1967. During this period, the financial sector adopted traditional analog technologies such as the telegraph, railways, canals, and steamships. This allowed the rapid worldwide transmission of financial information, transactions, and payments, supporting financial connections across borders. This period also marks the first use of credit cards as a means of payment and changed the landscape of activities in the payment industry in the following years (Setiawan and Maulisa, 2020: 219).

2.2.2. FinTech 2.0 Era (1967 – 2008)

FinTech 2.0 era, which covers 1967 and 2008, was accepted as the period when electronic payment and clearing system was established and ATM and online banking became widespread. At this stage, the use of information technologies has increased with the development of products and services by traditional financial institutions (Demirdogen, 2020: 44).

In this period, clearing centers, which form the basis of ATM and credit card processes, started to be established and these clearing centers accelerated the change of communication infrastructure and the transition from analog to digital. The first form of Bankers' Automated Clearing Services-BACS, the clearinghouse that forms the basis of payment systems in England, Inter-Computer Bureau was established in 1968, and on similar dates (1970), the United States' payment system was created by the Clearing House Interbank Payments System (CHIPS) has come into operation (Arner et al., 2016: 9-11).

In the years following this period, NASDAQ was established (1971), SWIFT application was launched (1973), Bloomberg was established (1981), first mobile phones appeared (1983), online banking applications started (1985). In 2001, the number of online customers of eight banks in the USA reached one million. In 2005, the first direct banks without physical branches emerged in the UK (ING Direct, HSBC Direct). At the beginning of the 21st century, banks' internal processes, external systems, and interactions with their customers have been completely digitized. In this period, which lasted until 2008, traditional financial institutions were in competition with technology companies (Candemir, 2020: 83).

2.2.3. FinTech 3.0 Era (2008 – Present)

FinTech 3.0 has been used in the process from the 2008 Global Economic Crisis to the present day (Arner et al., 2017: 4). The global financial crisis acted as a catalyst for the start of this period. After the crisis, the alignment of the financial market was such that it fostered the entry and growth of innovative players and startups. The financial crisis had previously taken the form of an economic crisis that caused about 8.7 million people to lose their jobs in the United States alone. It eventually caused the public to lose confidence in banks, and the financial workforce lacking enough job opportunities found a new place to invest their skills and eventually evolved into FinTech 3.0 (Esposito and Tse, 2014: 2-3). Regulators' change in business models and incentives has increased banks' compliance obligations. Regulations laid out in this way have spurred the growth of other funding institutes and startups and other forms of financing such as peer-to-peer and crowdfunding. While the demand-side drivers of FinTech 3.0 were the loss of confidence in banks and the expectation of "one-click" delivery, the supply-side drivers included the availability of talented financial entrepreneurs who lost their jobs due to the crisis, and the regulations put forward to prevent a crisis. The future crisis and the telecom revolution that made the usability of mobile phones very easy have made it very easy to provide more sophisticated banking methods In the years following this period, Bitcoin was launched (2009), Peer to Peer (P2P) money transfer service Transferwise is created (2011), Apple was launched Apple Pay (2014) (Setiawan and Maulisa, 2020: 219).

2.2.4. FinTech 3.5 Era (2008 – Present)

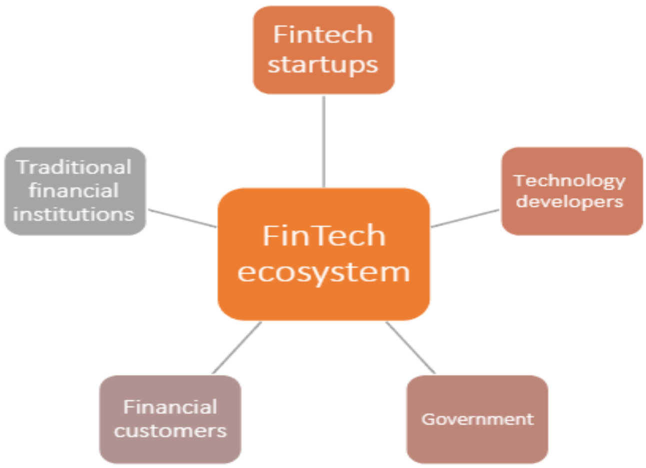
FinTech 3.0 emerged as a response to the financial crisis in the developed countries. However, when we look at the latest FinTech developments in Asia and Africa, the search for economic development stands out first. The period in these two regions is described as FinTech 3.5. The factors supporting the FinTech 3.5 era in these regions can be listed as high penetration of mobile devices, growth of the middle class, untapped market opportunities, lack of physical banking infrastructure and low competition among young and technology-savvy individuals (Marul, 2021).

After 2014, there was a non-linear rise in FinTech in the two most populous countries; namely China and India. Lacking large chains of complex physical banking infrastructures, these two countries have seen rapid growth in the FinTech sector. This, along with FinTech developments in Africa, is considered the growth engine for 2014-2018. This is led by SaaS developments such as Financial software of Indian IT companies, m-Pesa in Africa, Payment banks in India, Alipay in China (Agrawal, 2021).

2.3. FinTech Ecosystem

In order to understand the collaborative and competitive elements in FinTech innovation, the ecosystem must first be thoroughly examined. A stable symbiotic FinTech ecosystem is instrumental in the growth of the FinTech industry. Figure 3 indicates five main factors of the FinTech ecosystem (Lee and Shin, 2018: 7).

Figure 3: FinTech ecosystem



Source: Lee and Shin, 2018: 37.

The first element of the FinTech ecosystem is FinTech startups. These startups may differ according to the field of activity such as lending, capital market, crowdfunding, insurance FinTech companies. FinTech startups contribute to the FinTech ecosystem with innovative and often disruptive technology solutions. FinTech startups act as a catalyst in the production of new technologies, making them one of the most important players in the ecosystem. They are companies that offer solutions to users with innovative business models by adapting the opportunities offered by technology, digitalization, and mobile technologies to the financial field. The main features of theirs are initiatives that can be explained by the "LASIC Principles" (Low Margin, Asset light, Scalable, Innovative, and Compliance easy) (Chuen and Teo, 2015: 26). The second element of the FinTech ecosystem is technology developers. For example, big data analytics, cryptocurrency, cloud computing, and social media developers. The third element of the FinTech ecosystem is traditional financial institutions. For example, traditional banks, insurance companies, stock brokerage firms, and venture capitalists. They provide expertise to the ecosystem. In addition, collaborations between financial institutions and FinTech startups increase competition, quality, and customer experience by encouraging financial innovations. The fourth element of the FinTech ecosystem is Financial customers (e.g., individuals and organizations). The fifth element of the FinTech ecosystem is government. The government must create political and legal regulations to facilitate the development of the FinTech ecosystem and must also encourage entrepreneurial activities (Lee and Shin, 2018: 37-38).

EY (2018) evaluate the situation of the FinTech ecosystem and report four main topics of the FinTech ecosystem and the factors that have an impact.

Table 2: Four main topics of the FinTech ecosystem

Topic	Factor	Details
Demand	Market structure in the country	The structure of the current financial services sector and the place of FinTechs.
	Competition	The competitive environment within the FinTech industry, as well as between the FinTech industry and other financial institutions.
	Consumer behavior	The consumers' approach to the FinTech industry.
	Customer experience	Advantages of FinTechs regarding customer experience.
	Opportunities and threats	Opportunities and threats that FinTechs face in their fields of operation.
	New markets	New markets that might emerge in the financial services.
Regulation	Trust and security	The public trust in the services provided by the FinTechs in terms of data security and finance.
	New regulations	Designing and implementing new regulations that will organize the financial markets, and have an impact on the FinTechs.
	Operation permit	Operation permit especially in the fields of payment and e-currency.
	Limitations and obstacles	Limitations and obstacles faced by FinTechs when providing certain services.
Capital	Public funds and government aids	Public-sourced aids and incentives that are or could be provided for FinTechs.
	Banks	The investments and financial support in FinTechs by banks.
	Investors	The factors that have an impact on the angel investors, and public offering investors who invest in FinTechs.
	Business model	New and creative business models brought by FinTechs in order to collect new investment.
Human resources	Quality, quantity and costs	The quality and quantity of the human resources in the current market, and the costs of hiring or training new human resources.
	The role of the financial institutions	The role of the financial services institutions in training human resources.
	The role of the universities	The ability of universities and other educational institutions in training the human resources that can work in the FinTech sector.
	Entrepreneurship within the company	The approach of the institutions toward the entrepreneurial ideas under their roof.

Source: EY, 2018: 10.

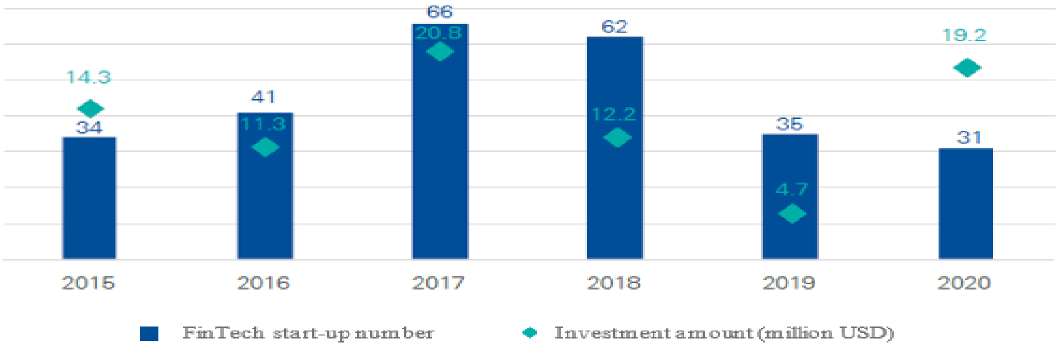
3. An Overview of Financial Technology Sector in Turkey

According to KPMG's "Pulse of FinTech" report, $105.3 billion in FinTech investments was made in a total of 2,861 transactions in 2020. Investors and FinTechs reversed this situation in the second half of the year after many deals stalled at the beginning of the Coronavirus (Covid-19) pandemic. The pandemic period led to a parallel trend with the global trend on behalf of the FinTech sector in Turkey. The "contactless transaction" trend, which has strengthened during the pandemic period, supports the rapid deployment of new technologies (BThaber, 2021).

Looking at the "FinTech Sector Overview from the KPMG Perspective" report, Turkey ranks 18th in the European continent after Poland with 139 million funding in 2020. The first three places on the list are the United Kingdom with 13.6 billion USD, France with 5.3 billion USD, and Germany with 5.1 billion USD. This volume, when only the Middle East countries are taken into account, Turkey ranks 3th (KPMG, 2021: 8).

Graph 2 shows new FinTech investments and capital inflows in Turkey. As seen in Graph 2, 31 companies were established in 2020. Although this level is below the previous years, the capital inflows provided to these projects are at the highest level since the end of 2017 (KPMG, 2021: 9).

Graph 2: New FinTech investments and capital inflows in Turkey

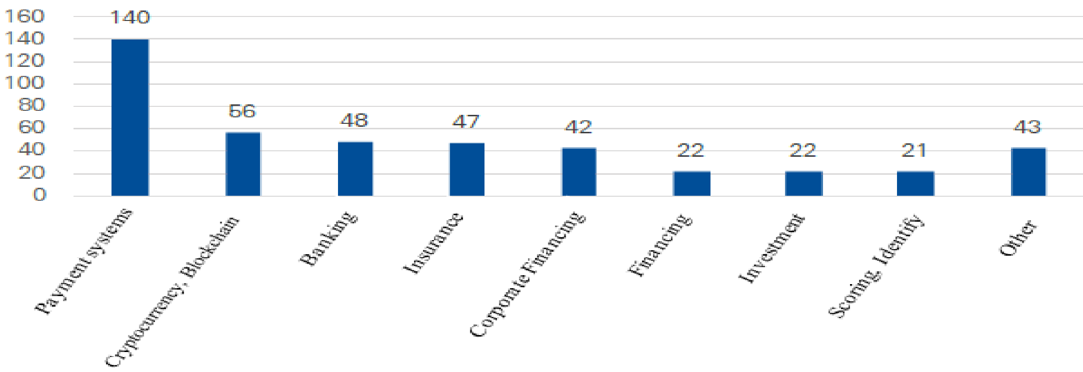


Source: Startups.watch, 2021.

Companies that attract investment in the world are payments, mobile banking, wealth management, lending, insurance, capital markets (financial modeling and analysis software), crowdfunding, and Blockchain-Bitcoin. In Turkey, on the other hand, payments, mobile banking, asset management, capital markets, and cryptocurrency companies attract attention (Deloitte, 2017: 6).

Graph 3 indicates the Turkish FinTech ecosystem - number of companies/sectoral breakdown. In Turkey, more than 80% of the 441 FinTech companies that exist as of March 2021 continue to exist. When we look at the focus of the established companies, the cryptocurrency companies that dominated the 2017-2019 period have been replaced by companies that focus on banking transactions in 2020. Payment systems companies are not the most established companies in this period, but they are by far the leader in terms of numbers (KPMG, 2021: 10).

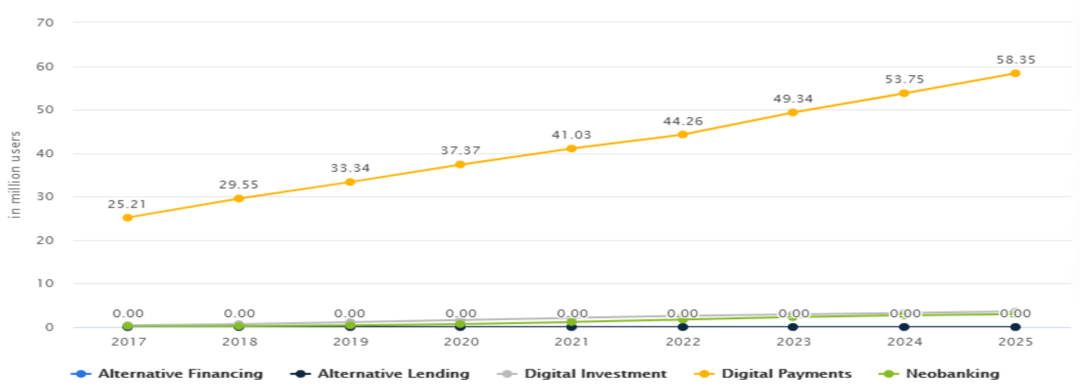
Graph 3: Turkish FinTech ecosystem - number of companies / sectoral breakdown



Source: Startups.watch, 2021.

FinTech companies are new financial sector players that offer services to their customers that provide various benefits thanks to digitalization. Payment services, bill payment, money transfers, API providers, debts and credit scoring, software services, cryptocurrency market, accounting, personal finance adjustments, crowdfunding, credit and prepaid cards, collection services are counted as areas where FinTech companies take charge. The most common usage areas of this technology today are mobile applications, digital payments and money transfers (Bilgel and Aksoy, 2019: 1099-1100). Graph 4 indicates FinTech users by segment in Turkey. Digital payments users reached 41.03 million users in 2021 (Statista, 2021).

Graph 4: Turkey FinTech user by segment

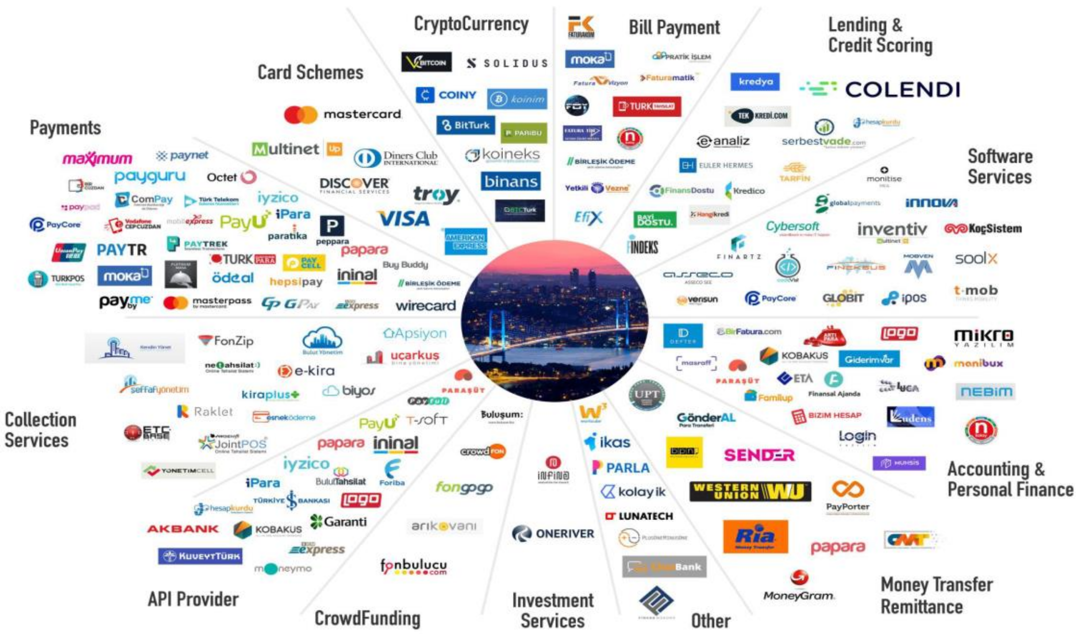


Source: Statista, 2021.

With the development of the FinTech sector, consumers can easily access the new products and services their needs and save time by using the digital environment. Today, consumers have been demanding more and more technological products and services, as consumers can access the internet almost everywhere. FinTech offers its consumers a personalized experience and more service options, in addition to price advantage and practicality (Truong, 2016: 4).

Turkey is transforming into a FinTech hub, with over 200 companies and an online payment market of over $35 Billion. Firms in the FinTech sector in Turkey are classified as payment, banking, credit, corporate credit, insurance, crowdfunding, investment, personal finance management, asset management, portfolio management, big data, centers and cryptocurrencies (FinTech Istanbul, 2019: 17). Figure 4 displays the Turkish FinTech ecosystem map.

Figure 4: Turkish FinTech ecosystem map



Source: Fintechtime, 2021.

Despite the rapid growth and development, the field of financial technologies in Turkey is relatively new and the overall economic growth rate is not high. Therefore, it is a fact that the FinTech pie is not very big yet. But in ecosystems where the pie is not so big, the growth potential is particularly high. Having a strong financial sector in Turkey is very effective in keeping the FinTech ecosystem alive and growing fast. In addition to the finance and banking sector, the country's young and dynamic workforce and especially talented human resources in the technology, finance and banking sectors have an important role in the rapid growth of the FinTech ecosystem in recent years. In addition to these advantages, Turkey, which uses its geopolitical advantage as a bridge between Europe and Asia, will become a regional financial technologies center in the near future. Besides, Turkey is not in a bad situation in terms of technological infrastructure and use of technology. It would be wrong to say that there are no opportunities for the FinTech ecosystem, especially considering the young population and the use of mobile devices (Deloitte, 2017: 5-6). Fintech sector is growing in Turkey and investments are expected to increase as well. With the strong support of the financial sector to FinTech startups - it will undoubtedly have a positive impact on the sector and its steady growth will be ensured.

Conclusion

FinTech, which is a combination of the words finance and technology, has been among the most trending concepts of the finance sector in recent years. FinTech is defined as a technological innovation that aims to strengthen and stay in competition with financial methods. In this way, the financial sector succeeds in establishing itself in the digital world. FinTech applications appear as an area where huge investments are made in the world and in Turkey. The United States and the United Kingdom are among the countries that attach importance the most to this sector worldwide. Facilitating people's access to financial services is the main purpose of FinTech applications.

FinTech has been continuing to growing rapidly in Turkey as in the rest of the world. While the development and growth in technology increase the quality and diversity of products and services, it is easier to respond to consumer needs thanks to FinTech. Especially, startups in the field of FinTech in Turkey since 2015, new business models, corporate collaborations, and investments have created the Fintech ecosystem. Looking at the developments in Turkey regarding FinTechs, it is seen that there has been a rapid development in the number of FinTech companies, investment amounts and transaction volumes in recent years.

Digitization efforts have been continuing rapidly all over the world. FinTech investments are very important for countries. FinTech does not only provide technological solutions to the financial sector but also allows traditional business models to keep up with our times. Countries that make very large and significant investments in this sector are struggling fiercely with a financial technology competition. Compared to other countries, developments in Turkey have not reached on a sufficient level yet. The FinTech sector has been growing in Turkey and investments are expected to increase as well. With the strong support of the financial sector to FinTech startups, it will undoubtedly have a positive impact on the sector and its steady growth will be ensured.

This study attempt to evaluate an overview of FinTech Sector in Turkey. Besides, in this study, information is given about the term FinTech, its historical process, and its ecosystem. Thus, this study will provide readers or researchers with an overview of the latest developments in the Fintech sector in Turkey.

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