EFFECT OF THE COVID-19 PANDEMIC ON ELECTRONIC PAYMENT SYSTEMS IN TURKEY

Hasan Selçuk ETİ[1]

Abstract

In 2019, the COVID-19 pandemic started in China, and the number of people infected with the disease worldwide, including those in our country, increased significantly between 2019 and 2021; in this context, many economic and social problems were encountered that the whole world was not prepared for it. In 2022, social and economic issues will continue because of the fact that the disease continues and the world as a whole is unprepared for the disease. The pandemic has brought new rules, such as wearing masks, social distancing, hygiene, etc., because of the disease's rapid transmission capacity. Governments have taken many measures, including curfews, and tried to prevent the spread of the epidemic during the pandemic period. With the pandemic, people's payment methods to buy their needs necessary to continue their lives have been the subject of our study. New payment technology was created in shopping points because people cannot go out on the streets and do not want to touch payment devices. This study mentions the developments and changes in payment technologies during the pandemic, our usage habits, and our adaptations to new technologies. When it comes to 2022, along with the pandemic period, it is seen that the habits gained in payment technologies continue.

Keywords: COVID-19 pandemic, New payment technologies, Contactless payment, Card payment systems, Mobile payment.

JEL Codes: M30, M31.

COVID-19 PANDEMİSİNİN TÜRKİYE'DEKİ ELEKTRONİK ÖDEME SİSTEMLERİ ÜZERİNE ETKİSİ

Öz

2019 Yılında Çin'de başlayan COVID-19 pandemisi sebebi ile ülkemizde de dahil olmak üzere tüm dünyada hastalığa yakalanan insan sayısı 2019-2021 yılları arasında ciddi artış göstermiş ve bu kapsamda tüm dünyanın hazırlıklı olmadığı ekonomik ve sosyal birçok problemler ile karşılaşılmıştır. 2022 yılına gelindiğinde hem hastalığın kısmi olarak devam ettiğinden hem de tüm dünyanın hastalığa hazırlıksız yakalanması sebeplerinden sosyal ve ekonomik problemler devam etmektedir. Hastalığın beklenmedik derecede hızlı bulaşma kapasitesine sahip olması sebebi ile alınan önlemler maske, mesafe ve hijyen başlıkları altında toplanmıştır. Hükümetler Pandemi döneminde sokağa çıkma yasakları dahil birçok önlemi almış ve salgının yayılmasını engellemeye çalışmışlardır. Hastalığın devam etme sürecinde insanların hayatını idam ettirmeleri için gerekli olan ihtiyaçlarını karşılamak için gerçekleştirdikleri alışverişlerindeki ödeme yöntemleri çalışmamızın konusu olmuştur. İnsanların hem sokağa çıkamamaları hem de alışveriş noktalarında ödeme cihazlarına temas etmek istememeleri yeni ödeme teknoloji ihtiyaçlarını doğurmuştur. Bu çalışma kapsamında pandemi döneminde ödeme teknolojilerindeki gelişim

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ve değişimler, kullanım alışkanlıklarımız ve yeni teknolojilere uyum konusundaki adaptasyonlarımızdan bahsedilmiştir. Pandemi dönemi beraberinde 2022 yılına gelindiğinde ise ödeme teknolojilerindeki kazanılan alışkanlıkların devam ettiği görülmektedir.

Anahtar Kelimeler: Covid-19 Pandemisi, Yeni Ödeme Teknolojileri, Temassız Ödeme, Kartlı Ödeme Sistemleri, Mobil Ödeme.

JEL Kodları: M30, M31.

1. Introduction

In December 2019, the novel type of the Covid-19 outbreak, which first emerged in the city of Wuhan in China's Hubei province and spread from there to the whole world, was declared an "international public health emergency" by the World Health Organization (WHO) on January 30th, 2020 and a "pandemic" (universal epidemic) by the World Health Organization (WHO) on March 11, 2020.

Considering that the world population is approximately 7.95 billion and the number of Covid-19 cases is 526.8 million, 1 in every 15 people in the world is infected with this disease, and the number of deaths due to the disease is approximately 6.3 million people. (Worldometers, t.y.)

Following the research, it has been determined that the epidemic is mainly transmitted from where people come into contact or where the viruses that are suspended in the air enter the body through the respiratory tract.

People who were found to be infected or in contact with infected individuals were quarantined in their homes and were not allowed to leave their homes for certain periods. The health status of these people was monitored by the Ministry of Health in our country during the quarantine period. The necessary medicines were delivered by the health teams of the Ministry of Health to be used at home in order to prevent the disease from progressing. In case of worsening of the disease, the patients were transferred to hospitals with the intervention of emergency health teams.

In light of the decisions taken by the governments of many countries in the world, entry, and exit to the relevant countries have been completely blocked, or people who will enter the countries have been quarantined for certain periods after reaching the relevant country.

Due to the pandemic, many facilities such as workplaces, schools, places of worship, and public transportation have been temporarily suspended in some countries. Many community events, including sports events, have been canceled or postponed. In addition, countries have gone through periods of so-called complete lockdowns, where all social interaction stopped except for basic needs. Melbourne, Australia, holds the record for full shutdowns, with six full shutdowns on different dates, totaling 263 days.

During the pandemic, masks, distance and hygiene were determined as the most important protection methods among the measures taken worldwide. Many countries have made the use of masks mandatory during this period and have decided to take punitive action against individuals who do not use them. Within the framework of the relevant measures during the period, societies have become particularly sensitive to hygiene. For this reason, people's unwillingness to touch any point during the pandemic and their desire to meet their daily needs as contactless as possible have caused them to use technology more than in the past. For these reasons, people's use of cash for their daily needs has gradually decreased.

It is seen that the payment systems we use to meet our needs in our daily lives, which are also the subject of our study, have also changed, the use of cash has decreased considerably, and in addition to this, the frequency of credit card usage has changed. For example, it is observed that the frequency of use of payment technologies has changed depending on credit cards.

This study will address the changes in the use of payment methods in societies within the scope of the habits acquired during the pandemic. Primarily, electronic payment systems, usage patterns, frequency of use, and changing habits with Covid-19 will be addressed be mentioned.

2. Historical Past of Electronic Payment Systems

Electronic payment technology favored in many of today's economies evolved from the banking system and retained basic features from this origin. In the past, payments were made by exchanging valuable items such as gold. In the 16th century, when jewelry banks emerged, ledgers of the customers' deposits were kept, enabling payments to be made by making changes to the ledgers rather than physically exchanging assets. Modifications to these ledgers only worked for customers who shared the same bank. Over time, the need to make payments between banks led to the emergence of a "central settlement" bank where all member banks could keep accounts, making interbank payments much simpler. (Ali, Barrdear, Clews, & Southgate, 2014)

2.1. Historical Past of Electronic Payment Systems in the World

Electronic payment systems were first introduced in 1850 by the company American Express in the form of Buffalo express instructions. In 1894 in the United States, the Hotel Credit Letter Company introduced the world's first "payment card" for prominent business people of the time, which could only be used at pre-designated hotels. Thanks to this card, business people met an alternative payment system other than cash for the first time. In 1914, Texaco introduced the first oil company credit card. Western Union Bank introduced the world's first "credit payment card" to its users with the motto "buy now, pay later". In 1958, Bank Americard, the early founder of Visa, launched the first generally accepted credit card. (Zengin & Güngördü, 2013)

2.2. Historical Past of Electronic Payment Systems in Turkey

In our country, the development process of the credit cards we use today is similar to that of European countries. However, in the West, the adoption process of consumer credit began first, followed by the introduction of credit cards to popularise the granting and use of consumer credit. In Turkey, unlike the Western processes, credit cards became widespread first, followed by consumer credit services (retail banking). The historical proliferation and usage process of credit cards in Turkey is as follows: (Kaya, 2009)

The first credit card introduced in Turkey, Servis Turistik AŞ, received authorization from Diners Club to launch domestic cards and started to offer the Diners Club card to its customers in 1968. (Interbank Card Center, History of Credit Cards, 1997)

After Setur launched its credit card, Türk Ekspres Havacılık ve Turizm Limited Şirketi also obtained licenses and started to launch American Express credit cards. These credit cards continued to operate without any further application until 1975.

After 1975, credit cards were introduced to the market in Turkey under the names Access, Mastercard, and Eurocard as part of the Interbank group. The rights to these credit cards were later transferred to Anadolu Kredi Kartları Turizm AŞ, in which Pamukbank and Genel Sigorta are large shareholders. In our country, credit card issuance activities started in the second half of the 1980s under the leadership of banks such as Vakıfbank, İktisat Bankası, and Emlak Bankası. They gradually expanded more and more over the years. (Güney, 2007)

As of 1980, other banks in Turkey have also introduced printed cards due to the demand and profitability of credit cards. Different credit card products have emerged (silver, gold, platinum cards, etc.).

In 1984, Visa, which still holds credit card licenses worldwide, opened an office in Turkey, increasing the momentum in the credit card and banking sector. With the arrival of Visa, Akbank, Türkiye İş Bankası, and Egebank started to offer American Express cards to their customers in Turkey.

In 1986, İktisat Bankası and again in the same year, İmar Bankası introduced credit cards to their customers.

In 1987, the Automatic Teller Machine (ATM) was put into service for the first time in Turkey.

In 1990, the Interbank Card Center was established with the partnership of 13 different private and public banks. (Interbank Card Center, History, t.y.)

3. Electronic Payment Systems in Turkey

Payment systems include the means that facilitate the exchange of goods and services, whether or not subject to commercial activities, between beneficiary stakeholders, the standards and legal regulations to be applied in these transactions, and the communication network between operating systems. According to the definition accepted by many experts, "payment systems" is defined as a system that provides the necessary systems for the clearing and subsequent settlement of transactions to organize the transfer of securities and funds arising from orders based on transfers between three or more participating institutions or persons and that has the necessary rules at the time of the realisation of these processes. (Masak, 2020)

Clearing refers to the execution of transfer requests transmitted to the system to realize transfers, mediation of the mutual realization of these requests, mutual provisioning before settlement in some systems, and clarification of payment requests sent to the system. Settlement is the process of fulfilling the obligations arising from the transfer of funds or securities between two or more institutions. (Central Bank of Turkey Republic, 2014)

Along with the Covid-19 pandemic period, it is noticeable that there have been some developments in the electronic payment transactions sector in our country, as in all countries and sectors. Many of these changes have been accompanied by both innovations in electronic payment systems and some changes in the frequency of their use. The differences in this area of usage, which will be discussed in the other parts of the study, will be shared with some data based on both the companies operating in the electronic payments market and the companies that want to develop their customer base with innovative technology activities in this field.

When electronic payment systems are evaluated, it is observed that the banking system is realized on the Internet, with the help of digital channels or mobile applications. When assessed in this context, the number of digital banking customers over the years is as follows

Table 1. Number of Active Retail Banking Customers

Number of Active Retail Digital Banking Customers			
2017 End of the Year	**2018 End of the Year**	**Increasing Users Count**	**Increase Rate**
33.374.269	42.287.984	8.913.715	27%
End of the Year 2018	**End of the Year 2019**	**Increasing Number of Users**	**Rate of Increase**
42.287.984	51.014.108	8.726.124	21%
End of the Year 2019	**End of the Year 2020**	**Increasing Number of Users**	**Rate of Increase**
51.014.108	62.827.155	11.813.047	23%
End of the Year 2020	**End of the Year 2021**	**Increasing Number of Users**	**Rate of Increase**
62.827.155	74.520.768	11.693.613	19%

Source: Banks Association of Turkey, 2022.

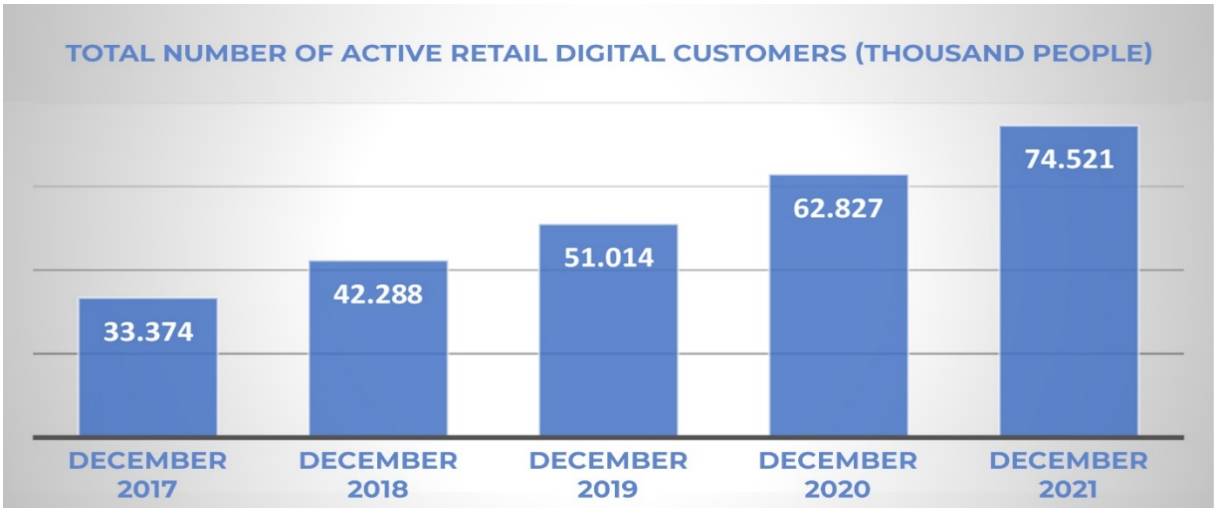
When the data are examined, especially when the date of 11 March 2020 (Koca, 2021), when the first pandemic case in our country was announced, is considered, I believe that the effects on payment systems in Turkey will be seen in approximately 2020.

When the data by years are analyzed, the number of digital banking customers increased by 27% between 2017 and 2018, and approximately 8.9 million people started actively using digital banking systems. As a result, the number of active digital banking customers exceeded 42.2 million as of the end of 2018. Considering that the market is gradually contracting and the number of new customers to join will also decrease in this context, the expected was realized in 2018, and approximately 8.7 million new active members were included in the digital banking system, with an increase of 23% in the number of customers.

By 2020, after the detection of the first Covid-19 patient in our country and, accordingly, the adoption of a series of new security measures, the increase in the number of digital banking customers, who closely interact with payment systems, was also observed. In 2020, there was an increase of 2% compared to the previous year and an increase of 11.8 million active customers compared to 2019, resulting in a 23% growth in the number of active customers.

In 2021, despite a proportional decrease compared to the previous year, considering the number of active customers in the system, an increase of approximately 11.7 million active customers was observed 2021 compared to the end of 2020.

Figure 1. Total Number of Active Retail Digital Customers (Thousand People)



Source: Banks Association of Turkey, 2022.

3.1. Payment and Securities Settlement System Operated by the Central Bank

Payment and securities settlement systems are of great importance for financial institutions and markets, citizens, public institutions and organizations, central banks, and commercial enterprises due to their role and position among the economic stakeholders in countries. Both in terms of the size and number of transactions that have been or will be executed, and the position of the executed or to be executed transactions within the financial market and real economy stakeholders, payment and securities settlement systems are also sensitive in terms of financial continuity.

The Central Bank of the Republic of Turkey has been given essential duties and powers over the payment and securities settlement systems operating in Turkey. In direct proportion to the importance of payment and securities settlement systems, the main objective of the Central Bank of the Republic of Turkey concerning payment systems has been determined as “ensuring the safe, uninterrupted, effective and efficient operation of the systems” in line with internationally applied standards. (Payment Systems and Financial Technologies General M., 2021)

3.1.1. Electronic Fund Transfer System (EFT)

In direct proportion to the developments in the banking sector and information technologies in Turkey, the EFT System, the processes of which were initiated for the first time in 1989, was opened for use and operation on 1 April 1992 within the scope of increasing interbank processes and reaching more users of the electronic banking services offered by technology-linked banks to their customers. The second generation EFT System, developed to meet the increasing demands and harmonized with the European Union payment systems standards, was implemented on 24 April 2000, approximately eight years later. As a result of these improvements, transfers in Turkish lira that real persons and legal entities wish to make without any limitations by using branches or telephone or internet banking can be realized quickly by sending an interbank payment order through the established system. The third-generation Electronic Fund Transfer System was introduced in 2013. (The Central Bank of the Republic of Turkey Headquarters, Electronic Fund Transfer System, t.y.)

The owner, operator, responsible, and auditor of the Electronic Fund Transfer System in Turkey is the Central Bank of the Republic of Turkey, according to Law No. 4651 dated 25.04.2001 and Law No. 1211 on the Central Bank of the Republic of Turkey.

With the introduction of the Third Generation electronic fund transfer system, an interbank TL transfer system and an inter-customer TL transfer system was established.

If we examine the use of the money transfer system, one of the essential tools of payment systems, during the pandemic period,

Table 2. Money Transfer Data in Turkey by Years

Money Transfer Data in Turkey by Years			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions (Thousand)	117.451	163.412	39%
Realized Volume (Million TRY	372.258	552.945	49%
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions (Thousand)	163.412	228.815	40%
Realized Volume (Million TRY	552.945	880.092	59%
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions (Thousand)	228.815	368.572	61%
Realized Volume (Million TRY	880.092	1.562.294	78%
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions (Thousand)	368.572	674.580	83%
Realized Volume (Million TRY	1.562.294	3.267.349	109%

Source: Banks Association of Turkey, 2022.

When the data are analyzed, an increase of approximately 39% is observed in the number of transactions in 2018 compared to 2017. In addition, a rise of 49% is observed in the number of transactions. When it comes to 2020, the beginning of the pandemic period, it is seen that there are increases compared to previous years. When the number and volume of transactions in the previous year are taken as a basis for the evaluation of the increases, it is observed that the increases continue cumulatively and that there are much higher increases in the following years compared to the first years.

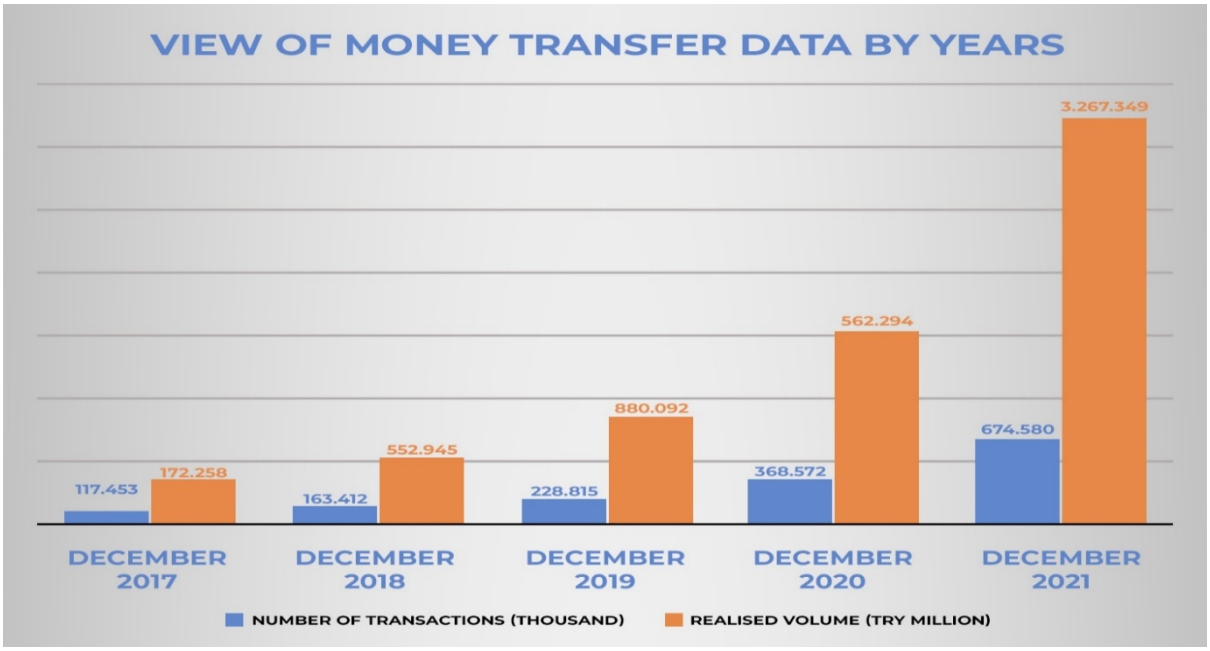
In 2019, both the number and volume of transactions increased compared to 2018. In 2019, there was a 40% increase in the number of transactions compared to the previous year, while transaction volumes increased by approximately 59%.

Within the scope of the first detection of the pandemic case in Turkey at the beginning of 2020, it is considered that pandemic differentiations will be observed more clearly when we compare 2020 to 2019. In this context in 2020, there was an unprecedented leap compared to the previous years, with a 61% increase in the number of transactions and a 78% increase in transaction volumes. With the effect of the pandemic, the sheer size of the rise in the money transfer system, which is one of the most used channels of electronic payment systems, can be observed.

Arriving in 2021, it is observed that the increases continue unabated compared to 2020, both within the scope of the pandemic continuing and the increasing usage habits of people in this field. For example, in 2021, there was an increase of approximately 83% in the number of transactions in the money transfer system compared to 2020 and an increase of 109% in transaction volumes.

When the realizations in 2017 and 2021 in the data set are evaluated, an increase of approximately 474% in the number of transactions and an increase of roughly 778% in transaction volumes was observed.

Figure 2. View of Money Transfer Data by Years



Source: Banks Association of Turkey, 2022.

3.1.1.1. Interbank Turkish Lira Transfer System

This is the system through which the payments related to the payment orders and transfers made by the banks in our country between each other and the correspondent services provided by the financial institutions operating abroad to these institutions to perform their transactions are realized with the commissioning of the third generation electronic fund transfer system.

3.1.1.2. Inter-Customer Turkish Lira Transfer System

This is the system in which payments and transfer orders between existing customers of banks operating in our country are implemented with the commissioning of the third-generation electronic fund transfer system application.

3.1.2. Electronic Securities Transfer System (EMKT)

The electronic securities transfer system is a system that enables the systematic realization of securities transfers between banks and stores the reconciliations of these transactions electronically. In the electronic securities transfer system, transfers related to securities issued by some public institutions

and organizations in Turkey and government domestic debt securities are realized. Electronic fund transfer systems are carried out within the scope of the principle of delivery against payment (ÖKT in Turkish). Following this principle, transfers of securities are realized simultaneously with the realization of the transfers of the payments related to the mentioned security. The electronic securities transfer system is operated between 08:00 a.m. and 5:30 p.m. on all working days of the week, except for official holidays in Turkey. The Central Bank of the Republic of Turkey is the owner and operator of the electronic securities transfer system. (Central Bank of the Republic of Turkey Administrative Center, Glossary of Terms, t.y.)

3.1.3. Instant and Continuous Transfer of Funds (FAST)

The Central Bank has developed a new model to carry out money transfers and payment transactions with TR QR Code 24 hours a day, seven days a week. It has offered this service to its users with flexible methods through member banks. With this new system called FAST (Instant and Continuous Transfer of Funds), bank customers in our country can transfer money to their accounts in different banks or to other accounts 24/7. On 18 December 2020, the FAST system, which was put into service as a trial application and was gradually opened to the use of bank customers, eliminated the distinction between wire transfers or EFT in money transfers at banks. (Canbaz & Erbaş, 2021)

3.2. Payment and Securities Settlement Systems that have received an Operating Permit from the Central Bank

One of the most important issues related to payment systems is the issue of "clearing and settlement". In the glossary of the Bank for International Settlements (BIS), clearing and settlement are defined as the transfer of transfer requests entered into the system and intermediation of these requests between related parties. Another essential issue in payment systems is settlement. The settlement means fulfilling responsibilities arising from transferring funds or securities within the scope of transactions between two or more related groups. (Masak, 2020)

3.2.1. Interbank Card Center (BKM) Domestic Clearing and Settlement System

The Interbank Card Centre was established with the cooperation of member institutions to find solutions to the problems experienced by banks belonging to public institutions and organizations, financial institutions, and private banks that are members of payment systems. The main objective of the Interbank Card Center is to develop the rules and related standards that the credit cards of private, public, public participation, and private participation banks in Turkey must comply with it. BKM was established in 1990 with the cooperation of 13 public and private banks that are members. (Sarı, 2019)

In 2019, the Central Bank of the Republic of Turkey was included in the shareholding structure, with the capital increase decision taken at the ordinary general assembly meeting. In this context, as of 2022, BKM has 11 partners consisting of public and private sector banks. (Bankalararası Kart Merkezi, Ortaklar, t.y.) The organization that is a member of the Interbank Card Center consists of three different classes. There are 30 BKM member institutions with bank status, 12 BKM member institutions with organization status, and seven institutions with service provider member status. (Interbank Card Center, Member Institutions, t.y.)

With the Domestic Clearing and Settlement system under its own management, BKM provides clearing and settlement services required for the settlement between the counterparties of transactions made with credit cards, prepaid cards, and debit cards belonging to institutions licensed to operate in Turkey.

The Domestic Clearing and Settlement system is a system that enables the settlement of these transactions between banks or organizations within the scope of any transaction carried out at the POS or ATM of another bank or organization with the card of any bank belonging to the user (Sarı, 2019).

3.2.2. Garanti Ödeme Sistemleri A.Ş. (GÖSAŞ) Takasnet System

In 1999, GÖSAŞ was established as a subsidiary of the Garanti Bank of Turkey. With the decision taken by the Central Bank of the Republic of Turkey, Garanti Ödeme Sistemleri A.Ş. (GÖSAŞ) was granted permission to operate as a card payment operator. GÖSAŞ is responsible for the entire infrastructure of Garanti Bank's card payment systems, from call centers to product development services. GÖSAŞ obtains its system infrastructure needs for all of its transactions from Garanti Technology, a subsidiary of Garanti Bank. (Şen, 2018)

GÖSAŞ achieved a first in the field of payment technologies by issuing the Bonus card, Turkey's first branded credit card with chip features, and the Miles&Smiles credit card, which earns miles under contracts with Turkish Airlines (THY).

Garanti Ödeme Sistemleri A.Ş. provides the clearing and settlement of expenditures made with Bonus branded credit and debit cards issued by Garanti Ödeme Sistemleri A.Ş. and POS devices at Bonus member merchants. GÖSAŞ performs the related clearing and settlement transactions through a reconciliation system called TakasNet. Currently, ten banks utilize the TakasNet system in this area (Central Bank of the Republic of Turkey Headquarters, Garanti Payment System A.Ş., t.y.).

3.2.3. Paycore Ödeme Hizmetleri Takas ve Mutabakat Sistemleri A.Ş. - Paycore Clearing System

Paycore provides clearing and settlement services to companies in Turkey licensed to issue or accept cards. In addition to the clearing and settlement system, it also offers ATM and POS services and all specialized hardware services, including new card issuance services upon request. Although PayCore was established under the name Provus Bilişim Hizmetleri A.Ş., in 2014, it was transferred first to the company Mastercard Incorporated and then to Kartek Holding within the scope of the shares belonging to this company. Paycore carries out various activities, such as intermediation in clearing and settlement transactions in Turkey and other countries. PayCore performs the clearing mentioned above and settlement services through payment systems called "PayCore Clearing System". This company has 7 participants as of 2022.

4. Card Payment Systems

Although card payment systems in Turkey are mainly associated with credit card payments, they are also systems that offer a wide range of uses other than credit cards, including debit cards and prepaid cards. Card payment systems have developed so rapidly in our country that they have started to be used instead of cash payments or payments made by check. While there are different types of cards used in the card payment system, their outlines are as follows;

Bank Card (Debit Card): These cards work depending on the user's current accounts.

Prepaid Cards: This card can work without being linked to any account, but beforehand, the card is loaded with enough money to be used.

Charge Card: Although this card type is similar to a credit card, no credit transaction is carried out on the card, and the entire balance must be paid when the due date arrives.

Credit Card: These cards allow one to make purchases within limits predetermined by the bank from which the relevant card was issued or to withdraw cash within limits set by the bank. (Vergi Konseyi, 2011)

4.1. Payment with Credit Card

The word "credit" is expressed initially as "credence" in Latin and means "to rely on someone". The word "credit card" is used instead of the words "security card" or "trust card", which are given when the issuing bank is confident that the loan will be repaid after the issuing bank performs the investigations. Credit Cards were initially used in the United States in the 1800s as payment instruments that are used instead of cash in many workplaces and do not have any regional restrictions. In addition, the introduction and use of credit cards in Turkey are similar to those in Western countries. The first credit card used in our country was in 1968 (Can, 2018).

In our country, credit cards are offered to customers with limits determined by the limit allocation teams of the issuer based on the intelligence gathered and past payment performances. With the relevant card, the cardholder of the card can make a payment to the appropriate card for the purchase of any goods or services, and this expenditure can be paid at the end of the period if necessary or can be paid in installments at the bank's interest/profit rates. Credit cards, which are an essential means of payment in terms of economic activities in our country, can also express prestige according to the type of credit card. In addition, it also allows access to cash within the scope of the cash withdrawal feature in case the cardholder is in need.

The most important feature of the credit card is that it brings an option to the long-used shopping system with cash, accompanied by electronic payment systems. Cards, which enable this exchange between the party in need of the product and the seller, allow the party in need of the product to purchase the product without the need for money at the time of the transaction. In contrast, for the seller, it allows the collection of money through the bank without the risk of open account borrowing from ancient cultures. Credit cards should be made of durable materials for frequent use. At the same time, it should allow transactions in the local currency of the country where the card is used. If the cardholder performs transactions in different countries, they should be able to conduct transactions in internationally recognized currencies. (Can, 2018)

During the pandemic, due to the outbreaks in our country, citizens tried to reduce contact. In this context, they have reduced their visits to bank branches to access the cash they need to have met their daily needs and meet their needs with as little contact as possible by using credit cards and ATM devices. Again, it is observed that the number of credit card transactions used in all daily or general purchases during the pandemic also increased. If we examine the data from the pandemic period and before;

Table 3. Credit Card Payments

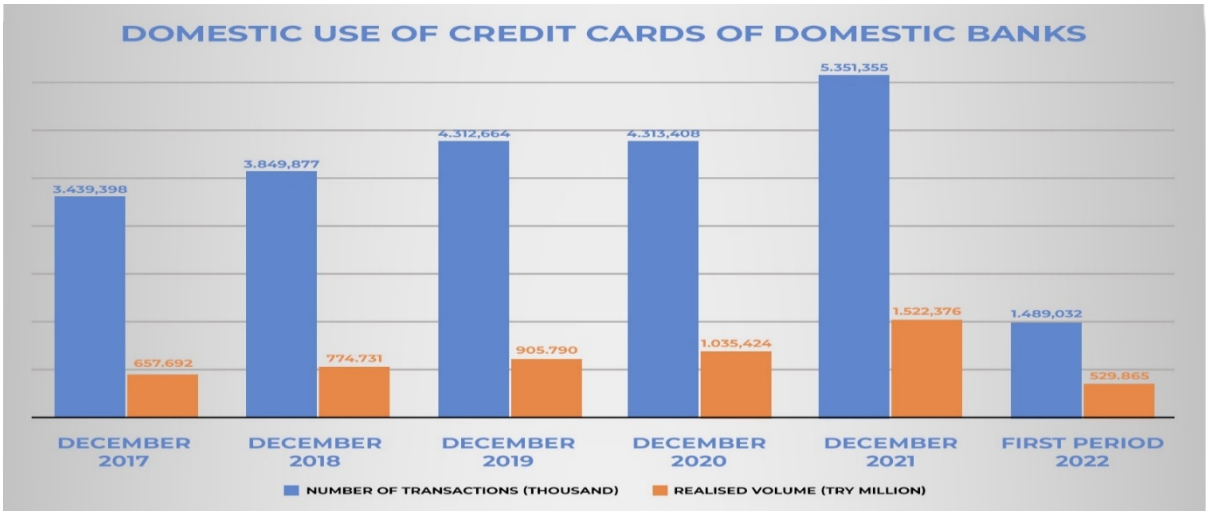
Credit Card Payments			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions (Thousand)	3.439.398	3.849.877	12%
Realized Volume (Million TRY	657.692	774.731	18%
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions (Thousand)	3.849.877	4.312.664	12%
Realized Volume (Million TRY	774.731	905.790	17%
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions (Thousand)	4.312.664	4.313.408	0%
Realized Volume (Million TRY	905.790	1.035.424	14%
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions (Thousand)	4.313.408	5.351.355	24%
Realized Volume (Million TRY	1.035.424	1.522.376	47%

Source: Interbank Card Center, 2022.

The data analyzed covers the period between 2017 and 2021 and refers to the total data on shopping or cash withdrawals made in Turkey with credit cards of domestically resident banks. When evaluated in this context, especially in 2020 and 2021, which we can characterize as the covid period, it is observed that almost similar transaction numbers were reached compared to 2019. However, when the data for 2021 and 2020 are analyzed, it is observed that despite the high base figures, there was a significant 24% increase in the number of transactions in 2021 compared to 2020.

If we evaluate the data on trading volumes, in 2020, a volume of over TRY 130 million was achieved in trading volumes compared to the previous year, representing a volume growth of 14%. By 2021, volume growth of 47% was achieved, surpassing the success of 2020. Along with this volume, the usage volume of credit cards in Turkey in 2021 grew by approximately TRY 500 million compared to the previous year.

Figure 3. Domestic Use of Credit Cards of Domestic Banks



Source: Interbank Card Center, 2022.

An analysis of the financial data for 2022/1 shows that the number of transactions reached approximately 1.4 billion. In addition, a volume of TRY 529 Billion is observed in the first quarter of 2022. Suppose the data remain parallel between the periods and are statistically annualized. In that case, it is estimated that the number of transactions to be realized at the end of 2022 will reach 5.6 Billion, and the transaction volume to be realized will be over 2 Trillion TL.

In the section on credit card payments, we can also examine the data on foreign banks' use of credit cards in Turkey. And in this context, we can observe the reflection of the measures on credit cards taken by our country for foreign guests from abroad during the pandemic period.

Table 4. Domestic Use of Foreign Credit Cards

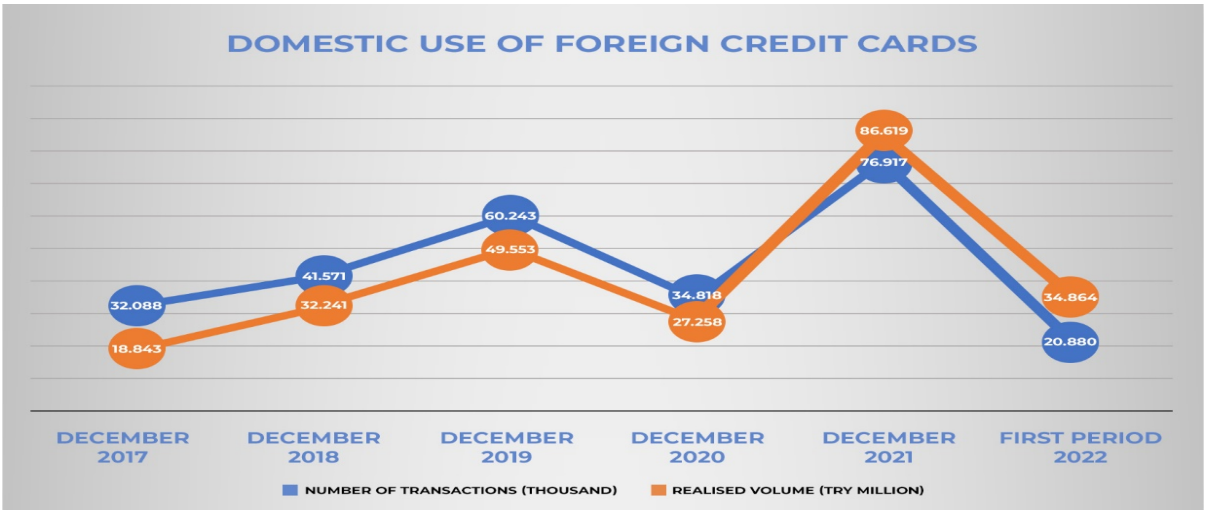
Domestic Use of Foreign Credit Cards			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions (Thousand)	32.088	41.571	30%
Realized Volume (Million TRY	18.843	32.247	71%
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions (Thousand)	41.571	60.243	45%
Realized Volume (Million TRY	32.247	49.553	54%
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions (Thousand)	60.243	34.818	-42%
Realized Volume (Million TRY	49.553	27.258	-45%
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions (Thousand)	34.818	76.917	121%
Realized Volume (Million TRY	27.258	86.619	218%

Source: Interbank Card Center, 2022.

When the data for 2020 is analyzed with the beginning of the pandemic period and the restriction of the entry of foreign tourists or businessmen into our country when the measures were tightened, there was a decrease of approximately 42% in the number of transactions of foreign cards in the country compared to 2019, and a parallel reduction of 45% in transaction volumes.

However, in 2021, when the measures were softened and the transitivity between countries increased, it was observed that the number and volume of transactions exceeded the pre-pandemic data, which had not been observed since 2017. In 2021, the number of transactions reached nearly 77 million, and the transaction volume approached TRY 87 billion.

Figure 4. Domestic Use of Foreign Credit Cards



Source: Interbank Card Center, 2022.

When the data for the 1st Quarter of 2022 is analyzed, it is observed that the number of transactions related to the use of foreign credit cards in our country has reached approximately 21 million, and a volume of around TRY 35 billion has been reached with these transactions. 2022 year-end data is expected to reach about 84 million transactions and a transaction volume of 140 billion by the end of 2022, with transaction volumes in line with the 1st period in the other periods of 2022.

When we examine the use of credit cards during the pandemic period in general terms, it is considered that the tendency to use credit cards during and after the pandemic period has increased compared to before the pandemic, the habits acquired during the pandemic period continue, and in this context, electronic payment systems will be used more by people during the pandemic period.

4.1.1. Contactless Payment with Credit Card

Contactless payments are actually a payment method that has been known for a long time. Considering the developed banking sector in Turkey, the first contactless credit card in Europe was introduced in Turkey in 2006. However, contactless payments are made in less than 1 second after the credit card is brought close to the device at POS machines with the contactless feature. The realization process of contactless payment occurs when the antenna in the chip on the contactless credit card communicates with the radio frequency wave on the POS device. (Interbank Card Center, seven reasons to make contactless payments, t.y.)

With the development of technology, it did not take long for the banks in our country to integrate this contactless payment technology into credit cards, debit cards, or prepaid cards, and the contactless payment feature has started to be integrated into the cards if we examine the cards with the contactless quality in the cards issued according to the years in this context;

Table 5. Number of Contactless Cards by Years

Number of Contactless Cards by Years	
The year 2017	**41.250.801**
The year 2018	**57.661.993**
The year 2019	**72.911.455**
The year 2020	**96.112.561**
The year 2021	**124.095.959**
2022/1. Quarter	**134.236.133**

Source: Interbank Card Center, 2022.

In 2017, only 41 million issued cards had contactless payment features, while according to Q1 2022 data, approximately 134 million cards in the market have contactless payment features.

Together with these increasing contactless payment features in cards, it has become necessary for POS devices to have this feature to perform this transaction, and in this context, the number of POS devices that can receive contactless payments in the market has changed as follows;

Table 6. Development in the Number of Contactless POS by Years

Development in the Number of Contactless POS by Years	
The year 2017	**1.103.108**
The year 2018	**1.519.140**
The year 2019	**1.897.894**
The year 2020	**2.335.626**
The year 2021	**2.629.274**
2022/1. Quarter	**2.716.470**

Source: Interbank Card Center, 2022.

Along with the increase in the number of contactless cards, there has been a parallel increase in the number of POS where payments can be made with contactless cards over the years. As of 2017, the number of POSs that can accept contactless payments was approximately 1.1 million, while the number of POSs that accept contactless payments increased to 2.7 million by the end of the 1st quarter of 2022.

The increase in the number of contactless cards and contactless POSs in line with the developing payment technologies shows that the habits of the market players and users have developed in this direction.

In December 2019, the covid-19 virus, the first case of which was detected in China and of which the first case was detected in our country in early 2020, and the development in payment technologies within the scope of the epidemic that occurred all over the world, caused significant changes in habits in the area of contactless payment. When the payment data realized with contactless cards in our country are analyzed over the years.

Table 7. Domestic and International Contactless Use of Domestic Cards

Domestic and International Contactless Use of Domestic Cards			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions (Thousand)	88.057	213.273	142%
Realized Volume (Million TRY	2.273	6.711	195%
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions (Thousand)	213.273	501.746	135%
Realized Volume (Million TRY	6.711	17.725	164%
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions (Thousand)	501.746	1.726.571	244%
Realized Volume (Million TRY	17.725	104.881	492%
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions (Thousand)	1.726.571	3.733.270	116%
Realized Volume (Million TRY	104.881	289.627	176%

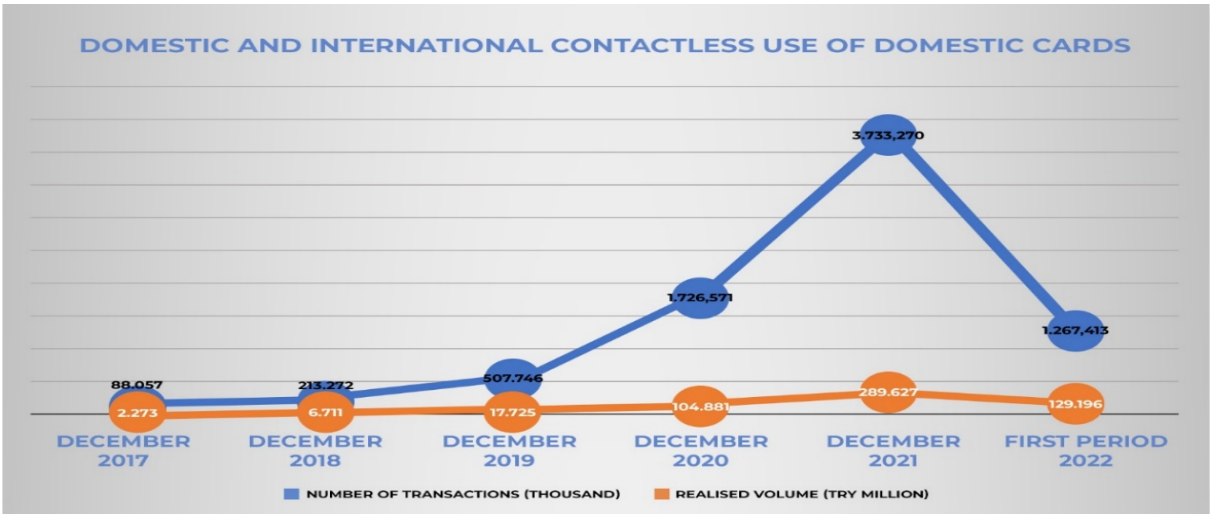
Source: Interbank Card Center, 2022.

Considering the increasing number of contactless cards and contactless POSs, it is assumed that contactless payment technology will also develop over the years. Still, especially with the effect of the pandemic period, serious increases are observed in the number and volume of usage in 2020.

In 2019, compared to 2018, the number of transactions increased by 135% to more than 500 million transactions and transaction volumes increased by 164% to more than TRY 17 billion. However, mainly when the data of the pandemic period in 2020 was analyzed, it was that an increase of approximately 2.5 times in the number of transactions was present compared to 2019, with more than 1.7 billion payments. Again, when the realized transaction volumes are evaluated, a 4-fold increase was realized in 2020 compared to 2019, and a volume of TRY 105 Billion was achieved.

The impact of users' sensitivity to hygiene and contactless payment habits on electronic payment systems during the pandemic stands out considerably.

Figure 5. Domestic and International Contactless Use of Domestic Cards



Source: Interbank Card Center, 2022.

When the 1st period of 2022 is considered, it is observed that the number of uses realized with contactless cards almost reached the realization figures of 2020, even in the first three months of 2022.

In 2022, if contactless card usage habits remain in parallel with the first three months, it is estimated that the number of transactions will reach over 5 billion by the end of 2022 and a transaction volume of approximately TRY 517 billion in parallel with this number of transactions.

4.1.2. Virtual Card Payment

Serious developments and changes in the field of technology are present in our country and in the world. In this context, in light of all these developments, especially online shopping has gained momentum, and with this speed, some updates have been needed in the trust environment. Due to the fact that the buyer and seller are not in the same environment, shopping on the Internet has been accompanied by situations such as malicious sellers or hackers stealing the card information entered during the transaction phase. In addition to the many security measures taken in this context, banks also offer virtual cards to their customers.

Virtual Cards are linked to the main card so the user can complete their shopping safely in transactions over the Internet. One can quickly create a limit and card number specific to the transaction it plans to perform on the bank's secure website. In recent years, the awareness of card users in terms of security and the acceleration of technology has led to a significant increase in the use of virtual cards. (Kalyoncuoğlu, 2018)

4.2. Debit Card Payment

Cards known as debit cards or bank cards allow the user to make transactions with the balance in their accounts at the bank. Cardholders can purchase goods and services with this balance in their accounts. Especially in the United States, it is observed that shopping with small amounts is done with debit cards, and the habit of using cards has become a culture. The use of debit cards, which has become widespread in our country as well, reduces the need to carry cash and therefore prevents losses or security problems. Although the use of debit cards is less frequent than credit cards because transactions are made with the balance in the account, it is observed that people who do not want to use cards have turned to this area in recent years, considering the security requirements. (Varıcı, 2015)

The data on payments made with bank or debit cards, which have a significant share in card payment systems that play an essential role in the development of payment technologies, are as follows.

Table 8. Domestic Use of Domestic Credit Cards

Domestic Use of Domestic Credit Cards			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions (Thousand)	2.646.730	3.165.677	20%
Realized Volume (Million TRY	667.408	805.862	21%
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions (Thousand)	3.165.677	3.640.811	15%
Realized Volume (Million TRY	805.862	971.663	21%
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions (Thousand)	3.640.811	3.611.720	-1%
Realized Volume (Million TRY	971.663	1.103.084	14%
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions (Thousand)	3.611.720	4.568.046	26%
Realized Volume (Million TRY	1.103.084	1.337.303	21%

Source: Interbank Card Center, 2022.

When the data are analyzed, although increases in transaction volumes are observed during the pandemic period, there is no significant increase in the number of transactions in 2020 compared to

2019, when the effects of the pandemic outbreak in our country were felt. Considering the tendency of consumers to make predominantly credit transactions in payments made with debit cards and considering the weight of credit card transactions mentioned in the previous topic, there was no improvement in the number of debit card transactions during the pandemic period. However, when the data for 2021 is analyzed, it is observed that both the number of transactions and volumes of transactions increased by more than 20% compared to 2020. At this point, it can be said that consumers have adopted the use of debit cards in payment technologies as part of their habits.

5. New Payment Technologies

Mobile devices, especially smartphones, are starting to have an important place in users' lives, and this process is developing rapidly every day. With this experience, technology companies are exceedingly becoming more aware of this area, and many new products, including mobile payments, are being offered to users. Mobile payments, which are also called Cashless Society and which can be evaluated as the death of cash, are recently among the most popular payment methods. Mobile payment technologies can be defined as all payment technologies that are realized without any physical contact, whether the buyer and seller are in the same place or not. With the ever-evolving economic activities and technology, it has been determined that in 2018, approximately one-third of the people worldwide who use the Internet made payments using mobile technologies. In 2019 it was determined that there were more than 400 million service recipients of mobile payment systems worldwide, of which approximately 65 million were in the USA. More than 8 million users were in the UK. (Eren, 2021)

Regardless of which technology is used as a means of payment at the time of purchase of any product using payment technologies, the infrastructure in which the payment takes place in our country is located within the banking system. In this context, if we examine the changes and developments in this area during the pandemic period, taking into account the digital and mobile banking data in our country without going into the details of new payment technologies;

Table 9. Number of Retail Active Customers Using Mobile Banking

Number of Retail Active Customers Using Mobile Banking			
End of the Year 2017	**End of the Year 2018**	**Increasing Number of Users**	**Rate of Increase**
28.712.012	38.385.355	9.673.343	34%
End of the Year 2018	**End of the Year 2019**	**Increasing Number of Users**	**Rate of Increase**
38.385.355	47.799.256	9.413.901	25%
End of the Year 2019	**End of the Year 2020**	**Increasing Number of Users**	**Rate of Increase**
47.799.256	60.334.014	12.534.758	26%
End of the Year 2020	**End of the Year 2021**	**Increasing Number of Users**	**Rate of Increase**
60.334.014	72.404.590	12.070.576	20%

Source: Banks Association of Turkey, 2022.

Turkey's mobile banking users have been increasing steadily over the years, with an average of 9.5 million active users between 2017 and 2019. In 2020, with the increase in pandemic cases in our

country, it was observed that there was an increase of approximately 12.5 million active users in the number of users who are considered to be using mobile banking and related payment systems.

When the number of active digital banking users is evaluated according to several demographic characteristics;

Table 10. Breakdown of Users by Gender

Breakdown of Users by their Gender (Thousand People)					
	End of the Year 2017	**End of the Year 2018**	**End of the Year 2019**	**End of the Year 2020**	**End of the Year 2021**
Woman	9.959	12.841	15.892	20.021	24.530
Man	23.415	29.447	35.122	42.807	49.991

Source: Banks Association of Turkey, 2022.

Among active users, the share of male users is higher than that of female users, and both user groups have increased over the years. Mainly when the data of 2020, which we accept as the beginning of the pandemic period in our country, is considered, it is observed that the rate of increase has reached peak levels regardless of the user group and in 2020, compared to the previous period, there was an increase of 26% in women and 22% in men.

Table 11. Breakdown of Users by Age Groups

Breakdown of Users by their Age Groups (Thousands)					
	End of the Year 2017	**End of the Year 2018**	**End of the Year 2019**	**End of the Year 2020**	**End of the Year 2021**
0 - 17	178	226	246	230	294
18-25	7.542	9.570	11.080	12.431	14.511
26-35	11.117	13.329	15.361	18.204	20.945
36-55	12.273	16.003	19.785	25.237	29.925
56-65	1.692	2.419	3.375	4.884	6.239
66+	572	741	1.167	1.841	2.607

Source: Banks Association of Turkey, 2022.

A breakdown of active digital banking users by age group reveals that most users are in two different age groups, between 26 and 55. When the data of the pandemic period are analyzed, it can be observed that, especially in our country, citizens over the age of 65 are more affected by lockdown restrictions than other citizens. In this context, it can be inferred that they have created or increased their habits of using digital banking channels in the field of payment technologies and banking.

5.1. Mobile Payments

Mobile payments are payments made via smartphones or devices using sim cards within the scope of the services offered by GSM operators. In this payment method, the usage of the goods or services purchased is reflected on the mobile phone bill, and the payment is collected with the mobile phone bill. GSM companies make prior agreements with the organization to which the payment will be made during the use of the system, and payments can be received within the scope of these agreements. However, its market penetration is limited as it depends on realizing agreements (Tekin, 2021).

5.2. Payment with NFC

NFC (Near Field Communication) stands for "Near Field Communication". This technological system enables two devices to communicate wirelessly and exchange information at a distance of less than 10 cm between the two devices. The NFC system works by sharing radio frequencies called RFID, where this radio frequency is 13.56 Mhz. When two NFC devices are next to each other, they transfer encrypted data to each other, enabling the payment to take place. Antennas and NFC chips are needed for this payment technology, which is impossible with all smartphones and devices. The contactless connection between two devices communicates with similar radio waves via the RFID frequency. This technology can only be actively used if the Mobile Phone and the NFC-compatible POS machine are in the same environment; remote connection is impossible in this case. In this payment technology, which is realized by bringing the mobile phone closer to the POS device, entering a PIN is unnecessary. The purpose of NFC technology is to enable fast and secure transactions. (İşler & Gülaç, 2017)

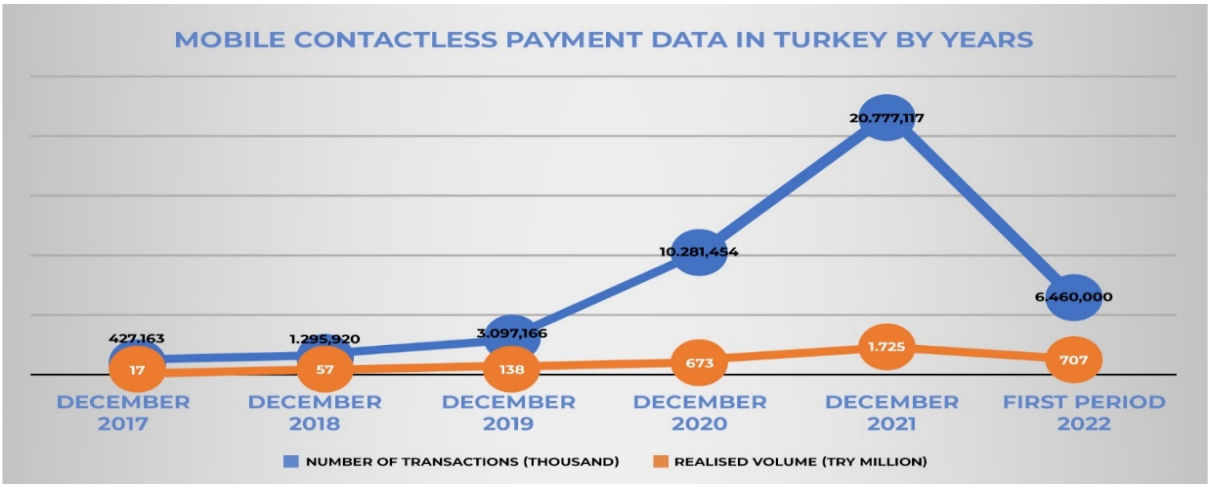
Table 12. Mobile Contactless Payment Data in Turkey by Years

Mobile Contactless Payment Data in Turkey by Years			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions	427.163	1.295.920	203%
Realized Volume (Million TRY	17	57	240%
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions	1.295.920	3.097.166	139%
Realized Volume (Million TRY	57	138	143%
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions	3.097.166	10.281.454	232%
Realized Volume (Million TRY	138	673	388%
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions	10.281.454	20.777.117	102%
Realized Volume (Million TRY	673	1.725	156%

Source: Interbank Card Center, 2022.

When the mobile contactless payment data, which is one of the new payment technologies in our country, is analyzed over the years, it can be observed that the frequency of use or usage habits, which were almost non-existent in 2017, entered a severe upward trend compared to 2019, along with the pandemic period in 2020. In particular, it is observed that the number of transactions, which was approximately 3 million in 2019, increased almost 2.5 times in 2020 and exceeded 10 million. Again, while TRY 138 Million volume was achieved in mobile payment transactions in 2019, this figure was observed to be TRY 673 Million in 2020.

Figure 6. Mobile Contactless Payment Data in Turkey by Years



Source: Interbank Card Center, 2022.

When the 2022 data is added, and the graph is analyzed, it is considered that the volume reached, especially in the 1st quarter of 2022, is above the pandemic period of 2020. In case this follows a parallel course throughout the year, a volume close to TRY 3 Billion will be achieved in 2022. When the number of transactions realized in the 1st period of 2022 is analyzed, it is estimated that the number of transactions at the end of the year will be over 25 million.

5.3. QR Code Payment

The QR Code (Quick Response) is a barcode that is very similar to the barcode we often encounter in shopping or daily life, created with motifs and shapes on a white-colored background. It is also called square code due to its square shape. Compared to the one-dimensional barcodes we often encounter in our daily lives, these two-dimensional barcodes can store and, within this context, transfer more data. QR codes were first developed in 1994 for use in the automotive sector. The developing company is Denso. The usage network is increasing daily due to its accessible communication, ability to store and transfer large amounts of data, and fast readability. (Bilir & Ergüner Özkoç, 2020)

The data on QR Code payment transactions in Turkey over the years are as follows;

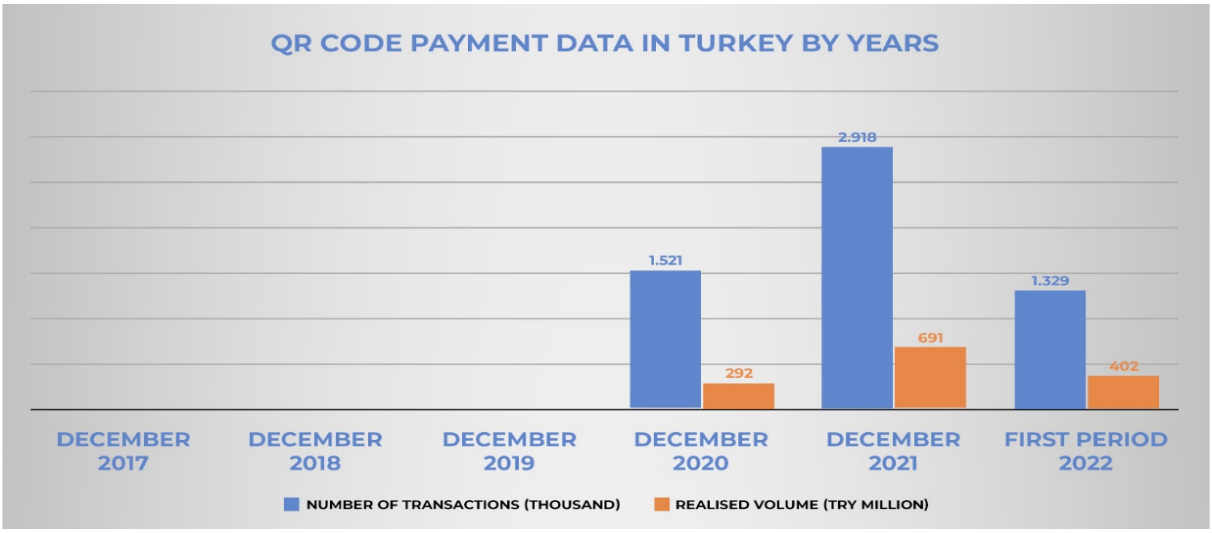
Table 13. QR Code Payment Data in Turkey by Years

QR Code Payment Data in Turkey by Years			
	Dec.17	**Dec.18**	**Horizontal Analysis**
Number of Transactions (Thousand)	0	0	-
Realized Volume (Million TRY	0	0	-
	Dec.18	**Dec.19**	**Horizontal Analysis**
Number of Transactions (Thousand)	0	0	-
Realized Volume (Million TRY	0	0	-
	Dec.19	**Dec.20**	**Horizontal Analysis**
Number of Transactions (Thousand)	0	1.521	-
Realized Volume (Million TRY	0	292	-
	Dec.20	**Dec.21**	**Horizontal Analysis**
Number of Transactions (Thousand)	1.521	2.918	83%
Realized Volume (Million TRY	292	691	109%

Source: Interbank Card Center, 2022.

When the data is analyzed, it can be observed that until 2020 QR Code payment technology was active 2020, and this period also coincides with the period when the pandemic started in our country. In 2020, with the use of QR payment technology, it was observed that the development and usage habits in contactless payment technologies are an increasing trend in our country. In 2021, a 2-fold increase in both the number of transactions and transaction volumes was present compared to 2020.

Figure 7. QR Code Payment Data in Turkey by Years



Source: Interbank Card Center, 2022.

In this graph, where the data for the 1st period of 2022 is analyzed as well, it is observed that even in the first three months of 2022, the number of transactions in 2020 was almost reached and exceeded in 2020 in terms of volume. In 2022, if usage habits and transaction frequencies continue in parallel, the year-end projection for 2022 is that the number of transactions will exceed 5 million, and the transaction volume will reach approximately TRY 2 billion.

5.4. Smart Watch Payment

Paying with smartwatches is different in the subject of another topic than paying with NFC. With the developing technology, payments can be made with smartphones and smartwatches with NFC chips and RFID antennae like smartphones. In this context, within the scope of the Bluetooth connection established between your smartphone and your smartwatch, your smartwatch gains the ability to communicate just like your smartphone, and payments can be made by bringing the smartwatch closer to POS devices with a radio frequency suitable for NFC encryption, just like mobile phones. (Mills, 2020)

5.5. Payment with Electronic Ring

With the development of technology, NFC-supported wearable technology areas are emerging and in this context and developments are taking place under the leadership of the company Visa. Another development is the “Payment Ring”. The technology was created by placing NFC-compatible microchips in a ring. After shopping is completed, when the payment point is reached, data is exchanged by bringing the ring closer to the POS device. The transaction can be realized without needing a smartphone or other technological device. The technology eliminates the need for security or losses by carrying cash and is generally seen as very functional for purchases of low amounts (Aytekin & Yücel, 2017).

5.6. Payment with Electronic Wristband

With the increase in user experience and satisfaction with wearable technology, new electronic payment instruments are being added daily. The Electronic Payment Wristband has also been developed in this context. It is designed to meet the user's demands, which is intended to resist daily sweat and water contact. People who wear unique clothes while doing sports or traveling by motorcycle, which we often encounter daily, may have difficulty accessing their wallets or phones. In this context, they can quickly pay for their purchases by bringing their wristbands closer to NFC-compatible POS devices without needing any other payment tool. (Aytekin & Yücel, 2017)

6. Payment with Smart Wallets and Digital Applications

Although we can say that the banking sector in our country is highly advanced compared to the examples in the world, it is observed that the shortcoming in the sector was identified by Techfin companies, which then introduced customer-specific payment options such as Amazon Pay, WhatsApp Pay, Apple Pay, Google Pay, Ali Pay, etc. to address inadequacy in the banking sector applications, which have had a significant impact on payment technologies. Along with the breakthrough of these companies, the banking sector is also following this trend and bringing innovations with it. With the easy, reliable, fast, and different options offered to their customers by these technology companies, which have high-level global transaction volumes, it is observed that the effectiveness of banks in the field of payment technologies is decreasing, and these companies are on their way to become the new arbiters in financial areas. With the intelligent wallet applications they offer their users, these companies eliminate their customers' need for cash, ATMs, and cards connected to the banking sector. They can quickly perform many banking transactions, including transfer orders, using the mobile phones they carry with them. (Sezal, 2021)

7. Payment with Virtual Currencies

Although there are many definitions of virtual currencies today, the first definition by reputable organizations was made by the European Central Bank in 2013. According to the definition made by the European Central Bank, Digital money is defined as follows: "Digital money that is unregulated, usually controlled by the people who develop it, and accepted and used by a certain virtual community." However, although such a definition was made in 2013, in 2015, it was defined as "a virtual value that is not issued by any central bank or credit institution and can be as a substitute for money in some cases".

In conclusion, banking systems and governments do not clearly articulate virtual currencies. However, from time to time, it is reported that some countries recognize it as a currency while others ban its use. It can be observed that some world-famous technology companies spread the news that they would trade with altcoins and then abandon this decision on the grounds of speculative movements.

Although virtual currencies are expected to occupy very different positions in the future, especially in the field of technological payment systems, their prevalence as payment systems is limited today. Countries that accepted Bitcoin, the first known virtual currency, as a legal currency are; El Salvador (as of 09.06.2021) and the Central African Republic (as of 23.04.2022). (İHA, 2022)

In the 2020s, the increasing frequency of crypto and virtual currencies and users' interest in this direction are considered helpful in creating virtual worlds. A new technology comes to the schedule every ten years in the world, and if we examine these technologies, considering the widespread use of PCs and usage habits in the 1990s, the development of internet usage habits in the 2000s, and the developments especially in the field of mobile technology in the 2010s, the new paradigm in 2020 has become "metaverse".

The Metaverse concept first appeared in Neal Stephenson's novel "Snow Crash" published in 1992. In this context, Metaverse is represented as a three-dimensional virtual universe where "Meta" means virtual and abstract and "verse" means universe. In these universes created with computer graphics, users can connect with these universes through some special equipment and the Internet (Ağırman & Barakalı, 2022).

In these different metaverse universes created by many companies with computer graphics, world-famous companies are also opening their stores. Many world-famous companies provide the opportunity to increase their brand awareness and shop at the stores they have opened in these virtual universes.

Walmart, one of the largest US-based retail companies, is among the companies that have opened a store in the virtual universe. In the introduced project, the store started to offer shopping opportunities from its store designed on the Metaverse. It aims to ensure that the purchases are paid with a crypto or virtual currencies and that this shopping in the virtual universe is delivered to the user's home by cargo. (Çakır, 2021)

8. Conclusion

In this study, the effects of the COVID-19 pandemic, which started in China in 2019, on the Electronic payment systems used in our country were evaluated. During the evaluation, the frequency of use of users and service providers over the years was highlighted.

Considering the electronic payment systems examined, especially considering the data shared by the Central Bank of the Republic of Turkey, it has been observed that there has been a regular increase related to the data of many payment systems used over the years.

Especially with the COVID-19 Pandemic, it can be observed that sectoral innovations in card payment systems, contactless payment systems, and wearable payment technologies are in an upward trend and users' tendencies in this direction are in an upward trend as well. In addition, during the pandemic period, some countries made cryptocurrencies available to relieve their strained economies and announced that payments to be made with some cryptocurrencies would also be accepted, leading to the development of the idea that the technology in payment systems will progress in the cryptocurrency sector as well as contactless payments.

As a result, when all these developments in payment technologies are considered, it is observed that banking systems and individuals adapt quickly to sudden changes that may take place. In this process of rapid adaptation, it is observed that technology is also effective in increasing the shares that companies receive or will receive from the new markets formed by closely following these developments.

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