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**THE RESPONSES OF STOCK INDEXES OF COVID 19 &**  
**TWO BIG EARTHQUAKES IN TURKEY**  
**MASTER'S THESIS**

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# ABSTRACT

The purpose of this study is to analyze the short-run impact of a pandemic-related event on Borsa Istanbul BIST 100 Index and 8 selected sectoral indices and explore the differences among industry responses. Following the event study approach, 8 sectoral stock indices are taken and their responses to a specific event day are analysed. The event day is 11 March 2020 which is the date for WHO declaration of pandemic and when the first confirmed case in Turkey was declared.

After completing the first event study in detail including our literature review on similar studies for the same event day of 11 March 2020, at the end we decided to extend the research with two more event days which are non pandemic to measure the reaction of stock market indices towards a pandemic event vs non pandemic events in order to analyze how strong was the stock market reaction towards COVID 19. Therefore, the second event day is selected as 17 August 1999 which is the date of Marmara earthquake which was the biggest earthquake in Turkey. This event day is selected as a non pandemic event day vs COVID 19 and also to analyze potential preventive measures and their impacts to support the stock market after a natural disaster like the earthquake.

The third event day is selected as 6 February 2023 which is date for Kahramanmaraş earthquake, the biggest earthquake in Turkey after 1999 Marmara earthquake. This event date is selected for the same purpose and also to compare the impact of the preventive measures taken to support the stock market at two different earthquakes to analyze whether there was any progress in the preventive action plan since 1999 earthquake.

**Keywords:** Covid-19, World, Economy, Stock Market, Borsa İstanbul, Turkey, Sector Indices, Event Study, Abnormal Returns, Earthquake

## **LIST OF ABBREVIATIONS**

AFAD	Disaster and Emergency Management Presidency
CDC	Centers for Disease Control and Prevention
EBA	Education Cognition Network
HES	Life Fits Home
IMF	International Monetary Fund
LGS	High School Entrance Exam
MEB	Ministry of National Education
PCR	Polymerase Chain Reaction
SARS	Severe Acute Respiratory Syndrome
TCDM	Tourism Crisis and Disaster Management
TDK	Turkish Language Institution
TRT	Turkish Radio and Television Corporation
TUBA	Turkish Academy of Sciences
TÜİK	Türkiye İstatistik Kurumu
UNICEF	United Nations Children's Fund
WHO	World Health Organization
BIST 100	BIST 100 Index of Borsa Istanbul
XUHİZ	BIST Services Index of Borsa Istanbul
XUSİN	BIST Industrial Index of Borsa Istanbul
XGIDA	BIST Food and Beverage Index of Borsa Istanbul
XBLSM	BIST IT Index of Borsa Istanbul
XTRZM	BIST Tourism Index of Borsa Istanbul
XBANK	BIST Banking Index of Borsa Istanbul
XUTEK	BIST Technology Index of Borsa Istanbul
XULAS	BIST Transportation Index of Borsa Istanbul

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# CHAPTER 1. INTRODUCTION

It is believed that Covid-19 virus identified on December 2019 which impacted the world was transmitted to humans from bats. The virus was unable to be controlled due to high infectiousness and this led millions of people around the world to lose their lives. Countries implemented some quarantine methods on their own to stop the propagation speed of the virus.

Individuals experienced significant changes in their lives as a result of government decisions. The daily lives of individuals changed. Some hobbies and habits were stopped. Countries closed their borders, implemented social distance limits in the society, and imposed curfews. People had to stay at home because they were unable to go out. As a result of this lockdown, people's spending increased. Due to this increase, there were problems in the supply of some products. Some sectors had come to the point of closure because they could not do business. Different volatilities and contractions were experienced in the sectors. The private sector lost its influence. The pandemic caused increased unemployment, increased inflation, decreased demand, cashflow problems and export and import limitation problems. The Covid-19 crisis, which started as a health crisis, turned into an economic crisis as time progressed, as its spread could not be stopped and a complete cure could not be found. The Turkish economy was also affected from this crisis. This crisis affected the stock market in Turkey as well.

Stock markets which have already been showing a sharp declining trend for some time under the uncertainty of the COVID-19 outbreak, collapsed in many countries with the declaration of pandemic alert on March 11, 2020. On that day, most stock markets were severely hit. Nikkei 225 and FTSE100 dropped by 10%. In France and Germany, indexes lost more than 12% and in Italy the loss was 16,9%. The situation was even worse in emerging markets. For example, MSCI Emerging Markets index dropped 10,5%, South Africa and Brazil stocks were down nearly 10% and 15%. The pandemic shock immediately showed its impact at Borsa Istanbul. Turkey's stock index closed the day with a 7,26% drop. After the Pandemic, the stock market tried to recover with some government actions. For these reasons, the impact of COVID 19 outbreak on the Turkish stock market is worth to be investigated in order to analyze the market reaction towards BIST 100 Benchmark Index and some selected sectoral indices to examine different market reactions. The event day (important pandemic

related event) is taken as 11 March 2020 on which the first case confirmed in Turkey meanwhile WHO declared the COVID-19 outbreak as a pandemic.

A dataset covering the dates between 2 March and 4 April 2020 (before and after this event day) were created. The data consists of returns of 8 sectoral indices and BIST-100 index.

In this context we employ an event study methodology to analyze the investor behaviour. After completing the first event study in detail, at the end, it was decided to extend the study with two more event days which are non pandemic to measure the reaction of stock market indices towards a pandemic event vs non pandemic events in order to analyze how strong was the stock market reaction towards COVID 19. Therefore, two more event days are selected as 17 August 1999 and 6 February 2023. 17 August 1999 is the date of Marmara earthquake which was the biggest earthquake in Turkey. 6 February 2023 is date for Kahramanmaraş earthquake which is the biggest earthquake in Turkey after 1999 Marmara earthquake.

The structure of the paper is as follows. Section 2 outlines recent literature on the impact of COVID-19 on the economy stock markets and social life. Section 3 describes the data and methodology employed in the study. Section 4 shows the empirical results and findings for the 3 different event days and it is divided into two parts where the first part is related with the reaction of stock market after COVID 19 and the second part is related with the reaction of the stock market after the two earthquakes. Section 5 includes the conclusion and it is also divided into two parts as explained in Section 4.

# CHAPTER 2. COVID-19 AND ITS MULTIDIMENSIONAL IMPACTS

## 2.1. Pandemic

### 2.1.1. Definition of Pandemic

The term pandemic is a contagious disease that spreads to a wide area by exceeding continents and affecting individuals in these countries. The virus can transmit between humans or from another living being to humans. The transmission process of the pandemic may differ. The risk of transmission may decrease or increase over time. Theoretically, the concept of pandemic is explained as the name of an epidemic disease that is generally experienced in the world, by combining the words pan (all) and demos (people) in ancient Greek (Turkish Academy of Sciences (TÜBA), 2020).

The seasonal epidemics around the world are not classified as pandemic. It can also be defined as a large epidemic, a global epidemic that affects a large part of the population (Morens et al., 2009).

The contagious risk of a disease is described as an epidemic. If there is a risk of transmission in a disease, there is a risk that this epidemic cannot be controlled and spread further. However, this situation is smaller than the pandemic or it is seen in a certain region. A pandemic is a disease that affects people in a larger geographic area.

According to the TR Ministry of Health (2020), a pandemic is “*the rapid spread of a disease or an infectious agent to a very wide area such as countries, continents, and even the whole world.*” According to the World Health Organization (WHO) (2020), pandemic is “*the name given to infectious diseases that threaten large numbers of people in a very widespread manner simultaneously in the world*”.

WHO defines pandemic in three different items (TÜBA,2020). These items are:

- Simple transmission of the disease to humans,
- Simple transmission among humans and continuity,
- Mutation and differentiation of the disease.

### 2.1.2. Features of the Pandemic

Humans experienced various pandemics since the first day of existence. Some of these are plague, cholera, typhoid fever, influenza, AIDS and smallpox. The common point



of these pandemics is that these diseases affected a wide area. The term pandemic has different characteristics. These characteristics are:

**Table 2.1.** Pandemic characteristics

Infectiousness	Virus or epidemic can easily be transmitted to humans. The transmission of epidemic diseases in the community differs according to the community level. If the virus can be infected easily, if its virulence is high, if the immune status of the people who make up the community is not healthy, if the contacts and coexistence of people are high, it is expected that the rate of contagion in that community will be high (TÜBA, 2020).
Noviceness	The term pandemic is the definition of diseases related to the mutation of a new or existing disease, but this definition is a subjective concept (Morens et al., 2009).
Wide Coverage	The term pandemic is the diseases that show their effects between the continents or in the world and that affect societies and people. Spanish Flue which affected around 1/3 of the world population led to some different diseases. This flu was more intense than other pandemics (Taubenberger and Morens, 2006).
Significance	The term pandemic is used more generally than other deadly diseases (AIDS, SARS). In the world, which has morbidity and high mortality, pandemic is defined as a new virus in which the immunity of populations is low (Rewar et al., 2015).
High Attack Probability	Epidemics in the world have high transmission speed and high probability of attack. If attack rates are low, it is not called a pandemic. West Nile virus that spread to Russia, Middle East and West Hemisphere in 1999 was not called a pandemic due to low contagiousness rate (Donalson et al., 2009).
Low population immunity	Although the contagiousness of viruses differs according to the immunity of people and communities, the infection status and transmission rate are important. If human and community immunity is high, this reduces the effect of the virus (Taubenberger and Morens, 2006).
Illness status	Along with the spread of the virus to wide geographical areas, the concept of pandemic is also defined as the sudden spread of the suddenly developing disease. An example of a plague epidemic can be given to this definition (Rewar et al., 2015).

### 2.1.3. Epidemics in the World

The pandemics and epidemics throughout the history had negative effects on individuals and caused them to lose their lives. In addition to these diseases, countries fought each other which led the people to lose their lives and the world population decreased. During the pandemics, social, economic and political changes were experienced and discoveries increased.

In ancient Greece, people believed that infectious diseases were experienced by God as punishment for their sins. Hittite King Murşili II explained in his "Plague Prayer" that the epidemic occurred at that time as a result of his father's great-grandfather Telepi breaking the edict and killing him (Tavukçu, 2020):

*“Princes, commanders, majors, officers who were on my father's side also died from the epidemic. That's why the country of Hatti began to die. The country of Hatti was plunged into disaster. Now the epidemic has become so strong that the Hatti country has been under*

*a lot of pressure due to the epidemic, its population has decreased. I, your servant Murshili, cannot overcome the distress in my heart, I cannot control the fear inside me. The Storm God of Hatti, my lord, my gods, this is how it happens. Sin is committed. My father also sinned. He disobeyed the word of Hatti's Storm God. I have not committed any sin. This is how it happens. His father's sin is passed on to his son, and my father's sin is passed on to me."*

The literature shows numerous epidemics throughout the human history. The first epidemic was Athens plague between 426-430BC. In this epidemic, in which approximately 1/4 of the population lost their lives, people living in city-states were also affected.

Another epidemic in the world after the plague of Athens is the Antonine plague. This epidemic had more severe consequences than the Athenian plague. The Antonine epidemic, which took place between 165-180 AD, showed its effect in a wide area and caused the Roman Empire to lose power.

Another epidemic seen towards the middle of the 8th century AD was the plague of Justinian. Although the exact origins of this epidemic is unknown, it is thought to have originated in Central Asia or Ethiopia. This pandemic, which showed its effect in Western Europe in military and commercial terms, caused the death of approximately 40% of the Byzantine population in 600 AD (Huremovic, 2019).

The effect of the black plague on medieval Europe was quite significant. In addition, this epidemic affected not only the health and certain segments of people, but also the political, economic, cultural and social lives of all people living (Genç, 2011). As a result of the fact that people's lives were affected so much, people gave more importance to their religion than the beliefs of that time, they held some religious meetings, but due to the increase in the spread of the epidemic in these meetings, a problem of trust in religion was experienced by the society. The epidemic has affected people's lives in every way, causing different restrictions and institutional changes (Yıldırım, 2020).

The Cholera epidemic, which was seen at the beginning of the 19th century, showed its effects intermittently until the 20th century. It was determined that the cause of the cholera epidemic was polluted air and water consumption, and many people died. The lack of precautions taken during the epidemic and the rapid spread of the virus caused the effects of the cholera epidemic to have severe consequences. People were relocated and settled in rural areas due to the insufficient measures. The main reason for the spread of the cholera virus to large areas is thought to be the active use of trade routes (Yaşayanlar, 2018).

The typhus pandemic in the 19th century showed its effects in wide areas due to the lack of nutrition and famine in the world. The wars experienced during the typhus epidemic

caused this epidemic to spread to large areas. The fact that the number of people who lost their lives from typhus is higher than those who died as a result of the war also explains this. When the speed of the epidemic increased, the states started to take some measures for prevention. The most important of these measures is to encourage people to follow the rules of cleaning and hygiene. The Ottoman Empire, on the other hand, suffered less losses than other countries, as it gave importance to the cleanliness of the state and society in general (Yıldırım, 2020).

The Spanish flu, which is the deadliest among the epidemic throughout the history, caused 500 million people which is equivalent to approximately 1/3 of the world, to be infected and approximately 35 million people to die. Before spreading around the world, the Spanish flu was seen in parts of Europe, the Americas, and Asia. Since there was no medicine or vaccine to combat this flu, the virus could not be fully controlled. To prevent the Spanish flu in the world, people were obliged to wear masks, schools, theatres and shops were closed, and the corpses of dead people were thrown into morgues like fish. The impact of the Spanish flu on the young population was quite heavy. This bad experience that people had at the end of the 1910s continued in the 20th and 21st centuries (Hays, 2005).

The Spanish flu, which is seen globally in the world, returned to their homes after the end of World War I. The return of the soldiers caused the epidemic to increase even more, and the pandemic spread all over the world. The spread of the epidemic was inevitable, as the world population was already prone to illness due to low immunity and starving due to famine. The fact that countries are not transparent in news and cases related to the epidemic and the lack of policies within the scope of combating the epidemic has caused it to become even worse.

Influenza viruses and AIDS have killed millions of people around the world. The Ebola virus, which first appeared in the world in the 1970s, has been named as a new disease epidemic due to the different symptoms it shows on humans. The main reason for the recent Ebola virus in West Africa to emerge is that the water is polluted and some animal meat and milk are consumed without being well-cooked. The lack of health facilities in West Africa has caused people to do some routine checks, leading to increased risk of infection in society.

The coronavirus-induced SARS (Severe Acute Respiratory Syndrome) virus, seen in China in the early 2000 years, has infected 8000 people in nearly 40 countries. Following the SARS-COV virus, MERS-COV (Middle East Respiratory Syndrome coronavirus), which emerged as a new type of coronavirus in 2010, has been seen worldwide. The Zika virus, the

Dengue virus and the Chikungunian virus are among other viruses that were seen in different regions of the world (Osterhaus and Reparent, 2017).

The virus of pig flu (H1N1) emerged in 2009. When it first appeared, this disease was classified as a pandemic. Today, coverage is not as wide as a pandemic. However, this virus triggers a harsher, more deadly epidemic of bird flu (Maital and Barzani, 2020).

The epidemics and pandemics that affect world history have negatively impacted the health of people in the world and the economies of states. The negative impact of the economy directly affects people's basic needs such as nutrition. This is causing instability in the economies of different states. This is because losses in such cases are large and are long-term and costly to mitigate the impact or to turn the negative situation into positive. To give an example, the Ebola epidemic in West Africa has seriously affected the economy. The Ebola epidemic in Sierra Leone in 2015 has caused costs to be directly affected. These costs cost about 6 billion dollars (Gostin and Friedman, 2015), including health workers, hospitals, and medical expenses for patients.

**Table 2.2.** Number of epidemics and deaths in history from past to present (Turkish et al., 2020)

Pandemic Name	The time of the epidemic	Number of people who lost their lives in the epidemic
Antonine Pandemic	165-180	5 million
1st Plague Pandemic	541-542	30-50 million
2nd Plague Pandemic	1347-1351	200 million
Italian Plague	1629-1631	1milyon
Cholera Pandemics	1817-1923	1 million +
Russian Flu	1889-1890	1 million
Spanish Flue	1918-1919	40-50 million
Asian Flue	1957-1958	1.1 million
Hong Kong Flu	1968-1970	1milyon
SARS	2002-2004	770
Swine Flu	2009-2010	200,000
Ebola	2014-2016	11,000
MERS	2015- Today	850
COVID-19	2019- Today	6,475,000 (3 October 2022).

As shown in Table 1, there were epidemics around the world throughout the history. However, today's Covid-19 pandemic is not unusual to the world in terms of epidemics. The pandemic lead restriction of intercity travel which lead to financial problems and limitation of domestic and foreign investments. Economic impacts are indirectly causing social effects in this context.

## 2.2. Covid-19 Pandemic

### 2.2.1. Definition of the Covid-19 Pandemic

The Covid-19 virus that emerged in Wuhan, China in December 2019 which is also known as the new type of coronavirus, caused people to experience shortness of breath, fever and respiratory distress, such as coughing. These symptoms in humans has been investigated and as a result of these studies, was identified as a new virus on January 13, 2020. This unknown virus, described by the Wuhan Municipality Health Committee, has been identified in marine product restaurants and people working in animal markets. This virus has spread to other people in Republic of China cities, especially the city of Wuhan, and then to the world. In March 2020, World Health Organization (WHO) Director General Dr. Ghebreyesus said, *“At the moment, we are not witnessing the uncontrolled global spread of this virus and we are not witnessing large-scale serious illness or death.”* According to this description, this virus was not called a pandemic in the beginning but changed into pandemic status after March 2020.

Symptoms of the Covid-19 virus include high fever, cough and fatigue. Although initially considered a seasonal flu, the coronavirus is very effective in infectivity (Murthy et al., 2020).

According to the information contained in the Pandemic Influenza National Preparation Plan published by the TR Ministry of Health, the Coronavirus Science Board was established on January 10, 2020. This date is before the date that the world declared a pandemic for this virus. On 24 January 2020, the Ministry of Health of Turkey installed thermal cameras in the airports. Passengers from China were accepted to Turkey after health checks. The first case of Turkey was identified on March 11, 2020. Since that date, Covid-19 deaths have increased in Turkey and measures have been taken.

Some preventive measures have been taken while Turkey's pandemic process is being carried out by the state. These measures vary according to the course of the epidemic. These precautions were as follows:

#### **I. Precaution (March-April, 2020)**

The decisions taken by the President at the Coordination Meeting in the Fight Against Coronavirus were explained as follows; “Epidemics with severe consequences in the world have also been the trigger of great political, social and economic transformations. It is possible to see the traces of this process in many events that marked the history of humanity,

especially the Ottoman conquest of Europe and the Renaissance.” (T.C. Cumhurbaşkanlığı, 2020).

The ‘Economic Stability Shield’ preventive package received at this meeting consists of 21 items. Approximately the value of ‘100 billion Turkish Lira’ was allocated to this package.

Wearing masks in the public became mandatory. The "social distance" rule was implemented. Masks and new rules have been introduced in markets, shopping malls, public transportation, where high number of people gathered.

After people were forced to wear masks, masks could not be found on the market, masks on the black market increased to figures. To prevent this problem, the government provided masks for those who need a mask in the e-government application.

The Provincial Pandemic Council and Provincial Hifzissihha Rules have been started in Turkey. Additional measures were taken, and these institutions have authorized quarantine in line with the spreading speed of the virus.

"Vefa Support Groups" have been established in all regions of Turkey under the Presidency of Emergency Management and Governorship. These groups aimed to meet the basic needs of people in need. AFAD (Afet and Emergency Management Directorate) undertook the financial aspect (AFAD, 2020).

Education holidays were changed by the Ministry of National Education (MEB). Starting from April 2020, face-to-face education was stopped and online education was provided (T.C. MEB, 2020).

The ALO 184 support line has been established by the Ministry of Health to ensure that the coronavirus is well understood by the public and people can ask their questions.

The online application “Life Fits Home” (HES) was created to systematically monitor coronavirus cases. Individuals could login to this application with their TR ID number and this application facilitated the monitoring of positive cases (T.C. Sağlık Bakanlığı, 2020a).

The Covid-19 pandemic reached partial success both in the world and in Turkey as of June 2020. In June 2020, the number of cases in Turkey decreased to less than 1000. With this decrease, various restrictions in Turkey were removed. This is because people have been locked away for a long time, unable to meet their close friends, and have been affected psychologically by the fact that they can't do some mass organizations (Balci and Çetin, 2020).

## **II. Precaution (November, 2020)**

The second wave happened by the end of summer in Turkey just like other European countries. Since some of the precautions were removed and the weather started to get cold, people started to prefer indoors rather than outdoors. This led the inflation in Turkey to increase. The number of patients in Turkey reached its peak in the beginning of December. The number of patients in December has been more accurate, including the number of cases for patients who do not show symptoms (ILO, (International Labor Organization), 2021).

People were required to use their HES codes to participate in funerals, positions and condolences, to enter the shopping centers, to use the public transport and to be at indoor spaces.

At the end of 2020, negative PCR (Polymerase Chain reaction) test taken 72 hours ago became mandatory for citizens coming from abroad to Turkey.

In this process, Turkey has suspended flights from countries such as Britain, Brazil, India, China and South Africa, due to increasing number of cases in the world and the emergence of new variants (T.C. Sağlık Bakanlığı, 2020)

## **III. Precaution (April, 2021)**

The number of cases in Turkey started to increase in April 2021. The number of patients and cases reached to 40 thousand. Certain restrictive precautions were taken due to increased number of patients and cases. Following the cabinet meeting, the President announced that some restrictive decisions would be taken, similar to the period of the Second Precautions. Turkey experienced “partial lockdown” after this date.

The work hours of public workers were revised and I. Precautionary measures were applied. Additionally, some private banks and private companies revised their office hours.

The curfews were re-organized around Turkey. The curfews were taken back to 19.00 while it was 21.00 at the beginning. Weekends were included to this implementation. Between these hours, intercity travel of people was also prohibited, with certain exceptions.

Indoor venues such as gyms, cafes, restaurants, beauty centers and entertainment centers were closed, and a come-and-take, take-away order was introduced.

A capacity requirement has been imposed on the public transportation and vehicles used by people for their urban transportation, and people aged 65 and over were prohibited from using public transportation again.

A lot of research has been done on the medical treatment of the Covid-19 virus, which has spread very rapidly in the world. Drugs and vaccines were used to combat the virus. There has been a challenging process regarding the characteristics of the Covid-19 virus, its modes

of transmission, methods of protection from the virus, and the number of patients and deaths. After this process, the loss of life of people's relatives, the high number of deaths affected people spiritually as well as the deterioration of their working life economically, and social reasons such as not being able to spend time with their relatives and not being able to go out (Kumar et al., 2020).

With the Covid-19 pandemic, the decisions by countries in the world have caused people to question the state in most countries. When problems such as unemployment and poverty were added to the problems people experienced during this period, the world faced a big problem.

The online education during the pandemic period has socially and economically affected many students, teachers and families. Global problems have also emerged during the pandemic. These problems have caused people experience negative physical and psychological issues and students to have problems in focusing on top of increased health problems and financial problems among unemployed families (Kumar et al., 2020).

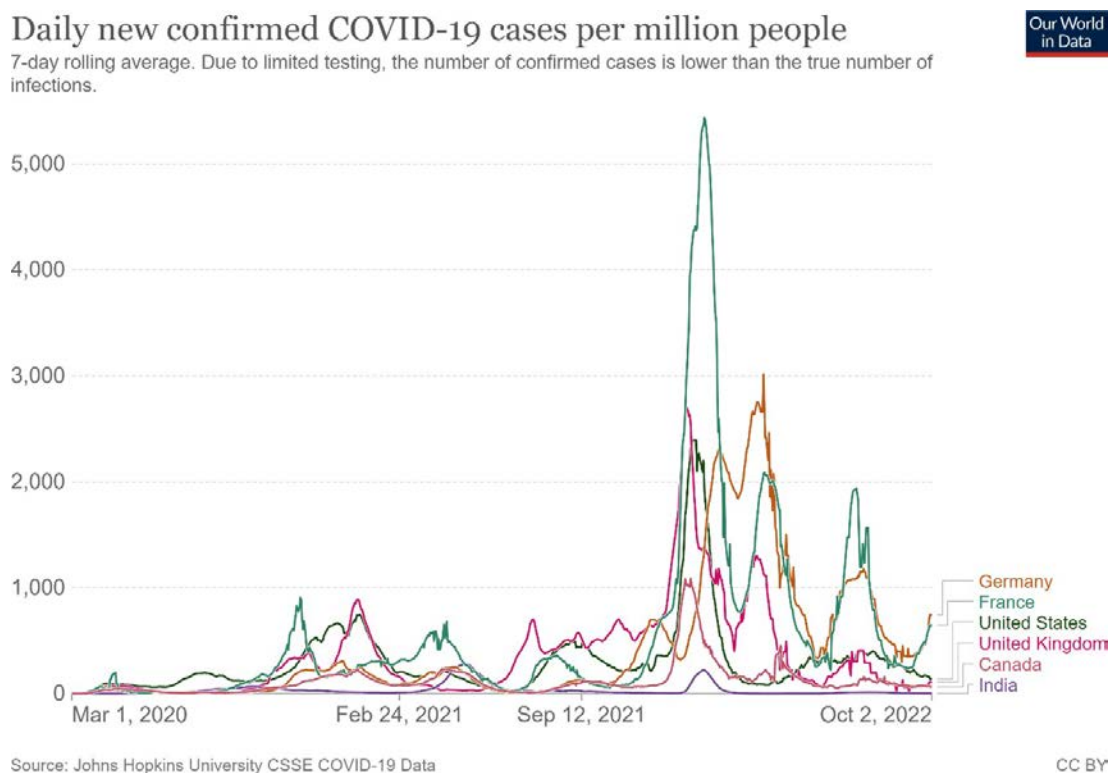
### **2.2.2. Origins and Development of the Covid-19 Pandemic**

Also known as SARS-CoV-2, Covid-19 virus is a highly contagious virus. SARS and MERS are in the same group. It is believed that this virus first transmitted from bats to humans (Kupferschmidt, 2020). Covid-19 virus was identified in 2019 at the end of December in Wuhan, China (WHO, 2020). Following the detection of the virus, China has also denied the news that has not made a public announcement about the virus. After the number of viruses increased, China announced that it had quarantined Wuhan and revealed the presence of the virus (BBC, 2020). The disease was first spread to the nearby countries of China, and then to the America and European continents. The late sharing of the disease with public and people had a negative impact on the spread of the virus. The first Covid-19 case in Europe was identified in France. Then, Covid-19 cases were identified in Germany and Italy (European Centre for Disease Prevention and Control, 2020).

The epidemic due to the Covid-19 virus has been ongoing for almost two years. Around 600 million people worldwide have been affected by this virus and nearly 6.5 million people have died. Since 2021, people began to vaccinate, with the presence of Covid-19 vaccine in the world, but the virus has yet to be completely contained.



**Figure 2.1.** Number of People Who Lost Their Lives Due to Covid-19 (until October 2, 2022)  
Worldwide (Our World in Data, 2022)



The lack of control of the Covid 19 virus led to high transmission rate (Zhang et al., 2020). WHO (2020b) stated, “It is transmitted through close contact with infected persons through contaminated objects or surfaces or through oral and nasal secretions. These include saliva, respiratory secretions or secretion droplets. These are spread by being released from the mouth or nose when an infected person coughs, sneezes, talks or sings. People who are in close contact (within 1 meter) of an infected person, this contagious Weekly COVID-19 Infections Weekly COVID -19 Deaths Mortality (Infection-Caused Deaths) Fully Vaccinated Persons 5 when droplets get into their mouth, nose, or eyes, COVID-19 It has been explained that he can be caught.”

The other reason was that Covid-19 virus directly targets lungs. Therefore, permanent damage to people's lungs, other organs such as the heart was caused which triggered heart attacks (Wadman et al., 2020). About 4/5 of the people who are infected with this virus do not need treatment. If people who have been infected have previously had a health problem, this problem may cause respiratory distress (who, 2020c). Even if these patients are treated,

there may be adverse effects on patients later on. The most common of these effects is that people are constantly weary and feel tired (Wood, 2020).

## 2.3. Effects of the Covid-19 Pandemic

### 2.3.1. Social and Political Effects

These are the changes in the routine lives of people. People have some social needs, other than some basic needs. Education, artistic hobbies and events, desire to explore new places, entertainment centers, cafes and restaurants, etc. the places where people can meet their needs according to their preference, make people socialize. Some restrictions or limitations in these areas caused people to be affected psychologically and change their routine lives (Özkok et al., 2020).

The effect and results of the Covid-19 virus on routine life are grouped as follows (Haleem et al., 2020;

**Table 2.3.** Health effects of Covid-19

Health
Problems in detecting the virus, quarantining and treating people
Cases cannot be fully confirmed or the conformations are suspicious
Unprepared capture of the medical field to this virus
People neglect health problems and other diseases
Increased workforce for healthcare workers
The protection need of people
Problems with the medical supply chain

**Table 2.4.** Financial effects of Covid-19

Financial
People's production of basic nutrients is disrupted
The complete disruption of the supply chain in the world
Problems in domestic and international trade
Cash problems on the market
People's income is reduced

**Table 2.5.** Social effects of Covid-19

Social
The needs of the people in the service industry were not met properly
Postponing or cancelling large-scale organizations
International travel is interrupted
The lack of organization of events that have been organized for centuries
Psychological problems across the society
People being socially away from their families
Closing cafes, hotels, restaurants, entertainment centers, movie theatres and religious venues
Limitation or closure of social areas such as theatre, sports clubs, sports halls
Postponing major exams.

### **Effect on Education**

The Covid-19 virus, which has shown a severe impact on the world, has changed people's lives and has led to decisions being made. The education and teaching sector is service type with students, parents and staff. Face-to-face training had been stopped in Turkey after March 16, 2020. This has been implemented not only in Turkey but also in the world, and nearly 1.5 billion students had been affected. The UNICEF (United Nations children's Fund) has developed different ways for students to be least affected by this situation and not to be away from education and teaching activities (Micks and Mcllwaine, 2020) due to the lack of education face-to-face.

**Table 2.6.** Methods Developed by UNICEF According to Countries (Micks and Mcllwaine, 2020)

Indonesia	Some support and guidelines for the protection of students with remote education were provided. Programs have been released from television to help students who have problems with the Internet.
Ivory Coast	The Ministry of Education and the 'home school' initiative for the publication and recording of the courses on national television were provided.
Northern Macedonia	The TV class was formed in five different languages with volunteer teachers.
Latin America and the Caribbean	A #HomeLearning initiative has been launched that will make it easier for parents to adapt students and be shared with others.
Malawi	Online learning programs have been diversified through mass communication tools.
East Timor	Online books, videos, and additional resources are used for parents of students who are experiencing learning problems.
Rwanda	More than 100 radio scenarios based on literacy and arithmetic are established in the basic sense.
Ukraine	Learning Passport, a common learning platform in the world, has been used for the first time in Ukraine.

Education in schools remotely or online will reduce the deaths of this virus by approximately 3% (Viner et al., 2020). According to this result, the intermediate outbreak given to the traditional teaching model will reduce the rate of spread and mortality.

With the closure of schools due to Covid-19 in Turkey, the Education Information Network (EBA) platform was established by the MEB. In addition, training has continued through national television channel TRT (Radio and Television Association of Turkey). Videos, course reps, e-books, tests, events were broadcasted on these two channels. The Ministry of National Education has provided free internet packages up to 8 GB to all students to make the EBA infrastructure even more powerful (Özer, 2020).

The Ministry of National Education has completed its work within the scope of online training and has started training for students on EBA and EBA TV. Students and teachers were able to participate in the course at the same time with the Live Class Application. EBA TV is the 10 most visited in Turkey and 3 most visited in the world. It is described as a training site (Pisken, 2021).

The Ministry of National Education has considered research and development in vocational and technical training. Students who have studied in these schools have been given special materials such as N95 masks, disinfectant, protective canopy. Due to pandemic, LGS (High School Exam) in Turkey was organized in the schools of the students (Türkiye Bilimler Akademisi (TUBA), 2020).

### **Effect on Health Activities**

PCR tests are used for identifying Covid-19 for people. Samples collected from the mouth and nose are evaluated in the laboratory environment, and if this assessment is positive, it is known that the person has the Covid-19 virus.

In the 'COVID 19 epidemic Management and Study Guide' prepared by the Scientific Advisory Board on September 2021, the measures to be taken in almost all sectors and the daily Covid-19 table of the Ministry of Health includes tests, cases, deaths and recovery numbers. The purpose of this practice was to create social awareness. The provincial Health Directorates apply the PCR values received from the individuals, if they are positive, the treatments were specified for them. People coming to Turkey from abroad were considered to be people who were likely to have positive cases, and after arriving in Turkey, they were tested by family physicians in health care facilities (Türkoğlu and Kantas Yılmaz, 2021).

Two different methods were implemented in the fight against Covid-19. The first was the way to suppress it. This method had a hierarchical, sequential structure. This structure relates to the restrictive measures taken in the fight against viruses. In this way, it is important to build a system to track people, to make it easy for people to reach health care and to maintain an effective public-managed struggle. The main goal in this method was to quarantine and reduce the rate of spread of the virus as a result of contact with other persons in contact with Covid-19 positive cases. The more tests countries have done to their citizens, the more they could prevent the spread of the virus. The countries that have implemented this method have successfully achieved their goals. The method of sedation is to stop the effect of the outbreak in the long term, not in the short term. The UK can be given as an example. England has chosen the “herd immunity” method. They intended to keep their potential subsidies to a minimum that may occur in health care (Duran, 2020).

Turkey has developed some methods of pandemic in the fight against Covid-19. Additionally, information and communication technologies, participation and scientific data were noted. Case studies have been conducted to control the outbreak, operation centers have been established, science boards have been established and regular meetings have been held, and risk assessments have been taken care of. A 15-person operational center has been established by the Public Health General Directorate, including monitoring, reporting and strategizing news about the world's effects of the epidemic (Cumhurbaşkanlığı, İletişim Başkanlığı Yayınları,2021))

The public health management system is a system where people with Covid-19 symptoms are registered to the system after performing PCR tests, or contact with the Covid-19 positive case is a system where positive cases can be observed at home isolation processes, regular follow-ups and all treatments were available. In addition, filiation teams consisting of 3 people were established by the Science Board in all provinces of Turkey. The task of these teams was to prevent the spread of the Covid-19 virus and deliver the medicines of patients at home isolation process (Cumhurbaşkanlığı, İletişim Başkanlığı Yayınları,2021)

The Pandemic Influenza National Preparatory Plan was designed to ensure that everyone in Turkey knows about pandemic and that measures against pandemic are taken correctly. In fact, Turkey started this plan in 2004. This plan was created and published in 2006 by experts, academics and people assigned by the Ministry of Health (Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü, 2022).

The Covid-19 pandemic in the world and Turkey has increased the number of patients in intensive care units. Many governments have gone to some restrictions to provide adequate resources for other health care and prevent further spread of the disease.

The longer the health problem lasts in a country, the longer the economic hardship is. Thus, some cost-effective quarantine measures have been implemented to ensure continued health care systems, thus preventing the virus. Doctors, nurses and health workers were hired to be re-employed in the health sector. In fact, retired health workers have been called back to hospitals, and some measures have been brought up to prevent problems in the health system, such as hiring new graduate medical students. Approximately 15% of the positive cases needed treatment in the hospital and around 6% needed treatment in intensive care. Health Ministry officials tried to put new intensive care units into service quickly to prevent the health system from becoming blocked and collapsed (Demertzis et al., 2020).

The healthcare service studies revealed that awareness was at insufficient level. Countries evaluated the Covid-19 virus differently. Some methods of how people can protect themselves from this virus were shown. Nearly 1/3 of the people working in various health care institutions had some deficiencies in the fight against viruses in the report prepared by the National Association of nurses in the United States. Hospitals in Italy and France were found to be experiencing problems in terms of health care services. Doctors have experienced difficulties in treating individuals who have not taken adequate measures to prevent infection of the virus. The treatment of these patients was performed by the forces of their relatives (Gebru et al., 2021).

In the health system, the rapid spread of the virus, measures not taken for social distance and the increase in the number of cases, as they did not take the necessary precautions for people's cleaning, caused stress and tension for health workers who were under pressure and had intensive work load. The knowledge of the patient's previously experienced illness or chronic illness has helped health workers during the treatment period of the disease. In this process, some information models, such as remote monitoring of patients, tele health, artificial intelligence drug discoveries and clinical surveillance, were used to support health workers (Mantas et al., 2020).

In this process, health workers' intensive work in Turkey has caused health workers to increase their chances of getting the Covid-19 virus, even if they have taken full protection measures. Therefore, the Ministry of Health has announced that it will hire 32 health professionals to be more efficient in the fight against the outbreak as well as the work load. In total, health workers were given 24 million surgical masks, about 3.5 million N95 masks,

about 1.5 million antivirus coveralls and glasses. Health workers were provided free transportation in public transport and have stayed free of charge in state guest houses close to where they worked. In addition, regulations have been made regarding the increase of health workers' salaries and overtime wages (Sarı et al., 2020).

### **Effect on Tourism Activities**

According to the Turkish Language Association (TDK), the tourist concept is described as “rest, entertainment, sight, recognition, etc. for the purpose of traveling. People travel to explore new places, to get better education, to get more comprehensive health care, to participate in cultural activities and to discover natural beauty.

Any negative situation that could happen in the world, such as natural disasters, epidemics, political events, directly affects tourism. Therefore, the institutions or organizations in this sector must have a plan to deal with such adversity in the event of tourism. These plans were described as Tourism crisis and disaster management (TCDM).

TCDM is evaluated in three different factors: These (Shih-Shuo, 2021);

- 1- Human and budget resources
- 2- Prioritize tasks such as physical and job recovery, security, etc.
- 3- It is the transparent sharing of the correct information and the absence of false information.

The return of tourism to the country's economy is very important. The tourism industry is the industry where the most investment is being made and development is happening today, and is evaluated in different varieties as the development process. For example, education tourism, health tourism, cultural tourism, winter tourism, religious tourism, thermal tourism, etc. It therefore includes different dimensions (Indent, 2019).

The Covid-19 virus has affected many different industries, including tourism. The most affected among these sectors are the properties that provide accommodation, transportation and food. The most affected by tourism in the Covid-19 virus is the arrival of travel prohibitions both between countries and within the country. After these restrictions, people had to cancel the bookings they had already made. This resulted in business losses in hotels and lodging centers. Tourism companies, hospitality owners and other tourism sectors operating in both domestic market and abroad have been economically negatively affected. The countries have cancelled their flights in accordance with the decisions they have made.

The control of this outbreak has played an important role in the travel ban to reduce the number of cases, but in economic terms, it has caused major losses (spark, 2020).

Around 60 airlines in the world cancelled or restricted their flights to China since February 2020. Countries such as America, Russia, Italy and Australia have also imposed travel restrictions by their governments (Chinazzi et al., 2020).

On March 3, 2020, the decision taken by the Ministry of Interior in Turkey closed the entry and exit of thirty large cities and Zonguldak provinces except in exceptional circumstances (<https://www.icisleri.gov.tr>, 2020).

The Covid-19 epidemic has changed the way people travel. People started to make their travels with few people instead of groups. People preferred less crowded places. Therefore, camping, tent holidays or caravan holidays increased. The fact that people have carried out such tourism activities during the pandemic has led to the economic development of rural tourism. People have shown interest in thermal tourism, spring tourism, agricultural tourism and water sports (Arslan Muhacir and Tazebay, 2017). In addition, people's travels to natural beauty and their stays on these trips are also considered rural tourism (Ozcoban, 2020).

### **Effects on Human Health**

**Physiologically**, the Covid-19 had a high rate of spread among people and infecting people. Therefore, human physiological systems and tissues were affected by the virus. In humans, the virus itself caused chest pain, throat pain, hard breathing, high fever, dry cough, Symptoms such as fatigue, loss of taste and odor, diarrhea, nausea (Aslan, 2020).

The Covid-19 virus also causes different heart diseases such as arrhythmias, myocardial damage and hypertension (Iron et al., 2021).

**Psychologically**, the mental problems seen in the Covid-19 process are called "parallel pandemic" and the psychological problems caused by SARS are called "mental health disasters." This pandemic, which transformed people's psychology from positive to negative emotions, also caused depression, anxiety, stress, etc. (Güden, 2021).

In this pandemic, some measures were taken to prevent the spread of the virus and these measures caused people to have concerns about the uncertainty of this virus. People have been unable to leave their homes and social media usage has increased due to some decisions such as curfews. Regardless of the age, fear and anxiety appeared among all people during this pandemic. Such as the fear of losing people's families or loved ones from this



virus, or the fact that some things are not fully understood about the treatment process of this disease, can be an example of the concept of fear and anxiety (Ozcevik and Ocakçı, 2020).

The psychological factors that were common in children were depression, anxiety, communication issues and decreased appetite. The most severe psychological problems in children were the fear of anyone in their family getting infected, the lack of full focus, and the rapid irritation. It has been observed that the fear and anxiety of children living in places where the epidemic was intense and the number of deaths was high (Jiao et al., 2020).

The anxiety, worries and fear experienced due to some measures taken to prevent the spread of the epidemic to wider areas caused people to feel helpless. Some people with psychological disorders thought that they could get rid of this helpless situation by committing suicide. Balakrishna, 50, who lived in India on February 12, 2020, committed suicide after reading the news in the newspaper. This suicide was recorded as the first suicide in the Covid-19 pandemic. Covid-19 suspect was allegedly committed suicide in hospital by throwing himself down in India (Thakur and Jain, 2020).

People experience fear and panic in situations of uncertainty, such as natural disasters and epidemics. This state of fear and panic allows human avoidance behavior to occur. In general, when emotions like fear and anxiety start to develop in society, people start to lose themselves. The pandemic around the world reveal five different major psychosocial situations (Karataş, 2020).

- 1- People shop when they don't need it in a panic situation
- 2- People who are infected, or people who are related to the virus, are excluded by society
- 3- Health systems are kept busy
- 4- Failure to comply with mandatory measures to prevent the spread of the virus
- 5- There's a lot of conspiracy theories about the pandemic

Factors such as the possibility of people themselves or their relatives catching the virus, differences in their daily lives, economic problems, people spending a lot of time at home, lack of food and medicine, and quarantine conditions, were causing psychological problems for people. There have been financial difficulties due to people not working at this time and many people had not been fully fed (Taylor, 2019).

Some researchers in the health sector have already made predictions that such a pandemic could happen in the world, but the world has generally been caught off to handle this pandemic. The fear and anxiety that people have experienced in this pandemic has caused

an increase in anger, guilt, stress and some complications and people with chronic disease to become even more severe.

In some research, the overly interested health workers and the young population in the pandemic have increased the chances that these people experienced psychological problems (Stamu-O'Brien et al., 2020).

Patients who have survived Covid-19 are recommended for rehabilitation if they were in a psychologically difficult situation. Patients who have long-term breathing equipment experience ingestion disorders, which must be supported in multidisciplinary rehabilitation to regain ingestion functions and to improve speech skills with speech therapists (Lapina and Yakushev, 2020).

As the world's Covid-19 virus increased, people's daily routine lives had changes and variations. Governments have made an effort to identify positive cases along with their decisions, but have neglected the psychological conditions of people who have suffered the disease. The pandemic led increased stress symptoms, anxiety, post-traumatic stress and suicidal tendencies. People have decided not to consume Chinese food anymore, and avoided contacting with Chinese people. In addition, former US President Donald Trump's reaction to coronavirus has been a long time on social media (Guloglu et al., 2020).

The violence rate increased since individuals started to spend more time together during the pandemic. In this process, both physical and sexual violence by men to women increased. Additionally, child abuse increased as well (Emiral et al., 2020).

The announcement by Directorate of Turkish Female Association Federation stated that psychological and physical violence against women increased during the Covid-19 pandemic. This announcement was verified with data. The data revealed that physical violence increased by 80%, psychological violence increased by 93% and demand for women's shelter increased by 78% compared to period before March 2020. The increased violence is linked with spending more time at home, increased unemployment, financial problems, increased stress and anxiety, psychological challenges due to staying home and lockdown conditions (Ergönen et al., 2020).

### **2.3.2. Economic Impacts**

The impact of the Covid-19 virus on the world economy, its impact on commercial sectors and its impact on social welfare will be explained in the following headings.

### **2.3.2.1. The Impact of the Covid-19 Pandemic on the World Economy**

Governments around the world did a lot of spending to fight against the Covid-19 pandemic. This has caused an increase in public spending. There has been a decrease in the market impact, especially in the private sector. Inflation and unemployment have increased in most countries compared to the pre-pandemic period. There were decreases in items such as exports and imports as well as tourism revenues (Adıgüzel, 2019).

With Covid 19, tourism was the most affected sector in the world economy. In the service and industrial sectors of the countries, exports and imports have been disruptive and declined in the production stages. There were certain problems regarding the trust index between the manufacturer and the customer, which has resulted in a decline in this index. There were major losses due to increased spending on the state budget, and unemployment rates have increased. In this context, Covid-19 has revealed supply problems and issues around the world. The manufacturing in countries with supply-intensive structure almost halted. With these, the country's economies became smaller. With the economy shrinking, businesses experienced bankruptcy and some of the sectors were blocked. Since people were always at home, there have been huge losses in household income which lead to financial problems. Companies have experienced cash and liquidity problems (Adıgüzel, 2019).

In general, Covid-19 caused financial problems, decline in demand, increased unemployment, uncertainty, problems in production and other negative effects such as psychological problems around the world. These negative effects have caused a world crisis environment (Adıgüzel, 2019).

It has become the most important topic of agenda for the political, economic and social impacts of countries around the world. The pandemic started with preventive measures taken by some countries such as Singapore, Germany and South Korea to combat the pandemic and was believed to be fully contained in early 2021, however, things didn't turn out as expected. The epidemic could be partially prevented by the effects of vaccines and lockdowns (Tezel, 2020). The table below lists the number of cases and deaths of the Covid- 19 pandemic in the world.

**Table 2.7.** Covid-19 Pandemic Case and Death Numbers (WHO, 2022)

	Total Cases	Total deaths
World	625,740,449	6,563,667
Africa	9,353,691	174,679
Europe	260,311,182	2,112,438
US	179,662,403	2,853,417
Southeast Asia	60,422,465	798,556
Western Pacific	92,845,655	275,912
Eastern Mediterranean	23,144,289	348,652

**Table 2.8** Countries with the Highest Covid-19 Cases and Deaths (WHO, 2022)

The country with the highest cases	The country with the highest deaths
America (95,946,824)	America (1,059,255)
India (44,465,768)	Brazil (687,666)
France (35,619,600)	India (528,981)
Germany (35,383,015)	Russia (389,790)
Brazil (34,793,309)	Mexico (330,331)

As the table shows, the Covid-19 pandemic affected many countries in the world. As of October 22, 2022, a total of 625,740,449 cases were identified in the world. The total number of deaths was 6,563,667. If examined locally, the most cases were seen in Europe, the most deaths were seen in the United States. Although the vaccination rate was 80%, America continued to fight with this pandemic for a long time (Centers for Disease Control and Prevention (CDC), 2022).

Although the Covid 19 pandemic was different from the initial cases, it showed more spread. Developing or underdeveloped countries followed different methods to tackle this pandemic. Economic problems have emerged as a result of these restrictions, from closing businesses to people staying at home, from curfews to travel prohibitions. National and international travel, railway transportation, transportation activities, training, sports activities, the service and trade organizations were negatively affected by the pandemic. Economically powerful states spent money on the treatment of patients during the pandemic. This led increased inflation and unemployment (Acar and Duran, 2020). As mentioned earlier, the most effected industry from the pandemic was the tourism and service industry. A clear economic problem was experienced in this sector due to restrictions in eating and drinking places, restaurants, cafes, transportation and tourism sectors. Although the package service wanted to be fixed by pick-up service, the desired benefits were not achieved (corner,

2020). Supply and demand were also economically affected. During the pandemic, the reaction by the people or countries caused shock decrease in demand and increase in supply. However, it has negatively affected the economies, causing economic growth and downsizing (corner, 2020).

Although the pandemic had negatively affected many different sectors, it had positively affected some sectors. These positive influences enabled companies where products such as cleaning goods, masks and disinfectant were sold due to people caring about their cleaning. The sales of these products increased in general when other markets were in decline. The interruption in the supply chains around the world caused people, companies and countries to experience problems. Petroleum lost significant value due to demand shock resulting from the disagreement between OPEC (Organization of Petroleum Exporting Countries) and non-OPEC countries (Demirdoğen and Yorulmaz)

Table 2.9 shows the sectors most affected by the Covid-19 pandemic.

**Table 2.9.** Sectors Most Affected in the Covid-19 Pandemic and Levels (Köse, 2020)

The impact of Covid-19 on the sector	Industry
1	Education
1	Human health and social activities
1	Public services
1	Public administration and defense activities
1.5	Agriculture, livestock and forestry
2	Financial and insurance services
2	Construction
2	Mining and quarry
The impact of Covid-19 on the sector	Industry
1	Education
1	Human health and social activities
1	Public services
1	Public administration and defense activities
1.5	Agriculture, livestock and forestry

1-Low, 1.5-Medium Low, 2-Medium, 2.5-Medium Low, 3-High

As this table shows, the effect of pandemic on industries was experienced at different levels. Sectors were generally affected at high level while some sectors affected at low or medium level. Tourism, finance and trade sectors were negatively affected while the food industry was positively affected since this sector meets the basic needs of people. Real estate, hospitality, production sectors were the most affected sectors from pandemic while public, education, health and defense sectors were the least affected (Köse, 2020).

With the spread of the Covid-19 pandemic to the world, production processes were affected first. Factories and companies faced the danger of stopping production, and there

was a supply-oriented shock in uncertainty about how long this stagnation will last. With the spread of Covid-19, the measures taken by countries reduced consumption costs. This reduction caused demand shock in the economy. With the recession of the economies, the demand for goods and services decreased, especially demand in consumption expenditures in the service sector. Most important brands in Europe also discontinued their production due to these reasons (Aydın and Karabacak, 2020).

**Table 2.10.** Annual GDP changes (from 2020-2022) in the Covid 19 pandemic (OECD, <https://data.oecd.org/gdp/quarterly-gdp.htm#indicator-chart>) (Access Date: 22/10/2022)

Period	The country with the highest increase	The country with the highest decrease	Period	The countries with the highest increase	The countries with the highest decrease	Period	The countries with the highest increase	The countries with the highest decrease
2020-1	Ireland (2.7)	China (-10.3)	2021-1	Ireland (9.0)	Iceland (-3.8)	2022-1	Ireland (6.2)	India (-1.4)
2020-2	China (11.7)	India (-23.9)	2021-2	United Kingdom (6.5)	India (-10.0)	2022-2	Iceland (3.9)	China (-2.6)
2020-3	India (22.8)	Saudi Arabia (0.7)	2021-3	India (11.2)	New Zealand (-3.9)			
2020-4	India (8.0)	Ireland (-5.1)	2021-4	Slovenia (5.2)	Ireland (-1.9)			

The table above shows the country's annual GDP changes. In general, China and India experienced decrease while Ireland experienced increase. The highest decrease happened in Q4 2020 3 and the highest increase happened in Q3 2 2020 in India.

The following Table 2.11 provides financial and monetary policies that countries applied during the pandemic.

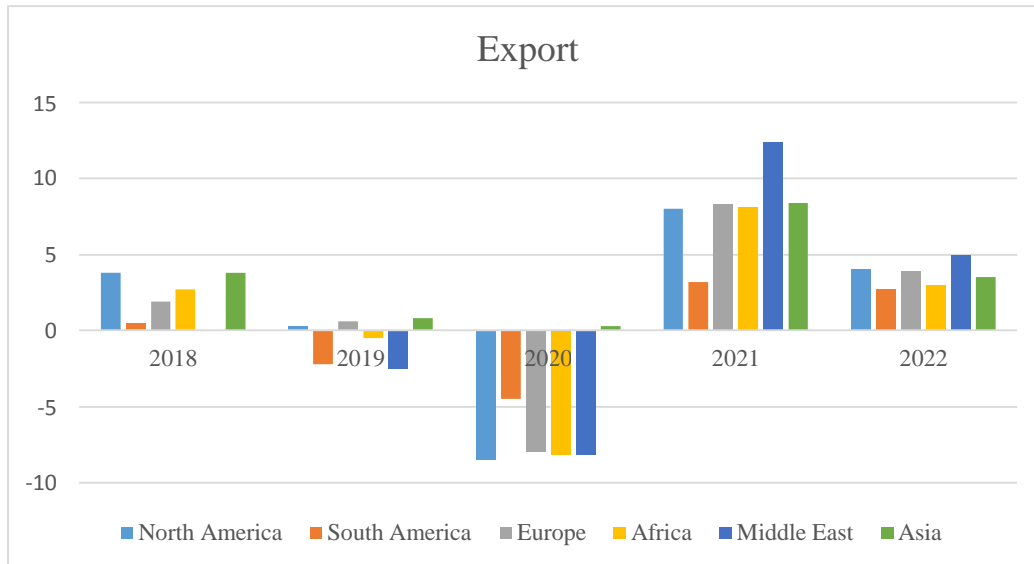
**Table 2.11.** Policies Implemented by the Countries in the Covid-19 Pandemic (Acar ve Duran, 2020)

Policy Type	Countries	Policies
Finance Policy Measures	Social benefits according to the number of individuals in the household	America, Australia, Turkey
	Providing economic support to people	America, Australia, India, England, Turkey
	Support for large governments for industries and industries that are most affected by this pandemic	America, Australia, England, Nigeria, Turkey
Monetary Policy Measures	Central banks provide cash entry into markets	America and China
	Mandatory regulatory transactions of banks and customer deferred interest to principal or interest (moratorium)	China, Ireland, Italy and Nigeria
	Acquisition of securities and bonds with rapid value of central banks of countries	America, Australia and Canada
	The reduction of interest rates for central banks of countries	America, South Korea, England, Canada, Japan, Nigeria, Turkey and New Zealand
	Credit benefit to Small and Medium Business (SMB), banks, public health, individuals and other business that may be considered important	America, Australia, England and Nigeria

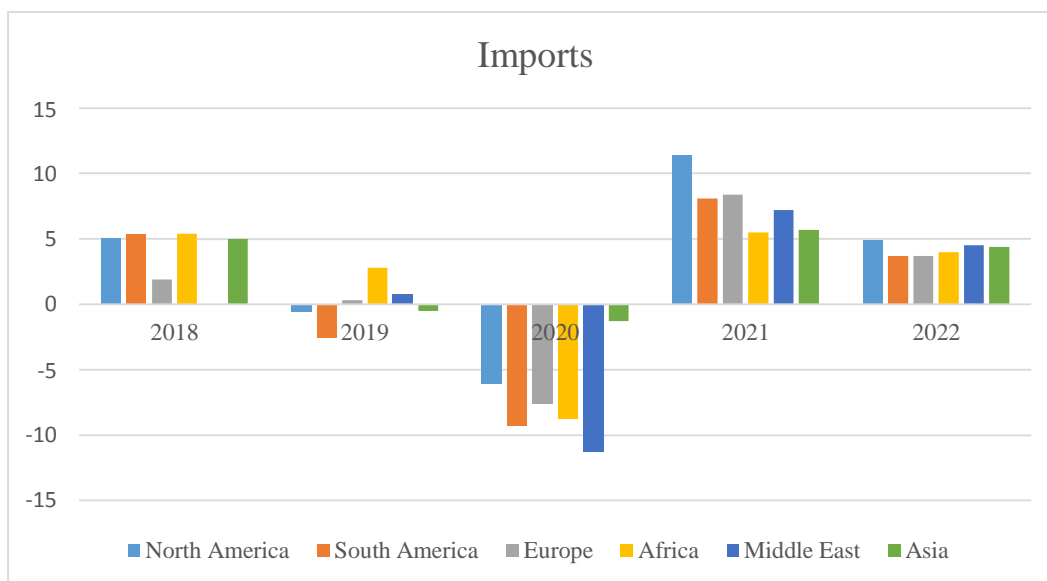
The economic recession due to the pandemic started to recover gradually. Various measures were taken to prevent this pandemic. Various sectors in the market positively affected these measures. A recession that could affect almost all of the world's economy has also caused sector shrinkage. The countries rapidly created financial and monetary policy, as shown in the table above to combat against the pandemic. At the beginning of the pandemic, America implemented a support package of about 485 billion dollars, and as the epidemic progressed, it had risen and found about 2 trillion dollars. This support package is the highest number among countries. Japan announced a support package of \$1 trillion to support the public and private sector. This figure is approximately 2 times the support package Japan has

made in the 2008 crisis. These financial aid packages are highly important in government GDP (Acar and Duran, 2020).

**Figure 2.2.** Volume of Goods Trade and Real GDP (2018-2022) (% change) (WTO, 2022) by Continents



\* 2022 was taken as 3 quarters.



The table above shows how the percentage of exports and imports between 2018 and 2022 according to the continents. Both the export and import graphic shows that the countries performed negatively in 2020 during the pandemic. In fact, exports and imports, which began to decline in 2019, completely plummeted during the pandemic in 2020. As of 2021, export and import numbers started to rise, and these increases continue according to the first 3 quarters of 2022.



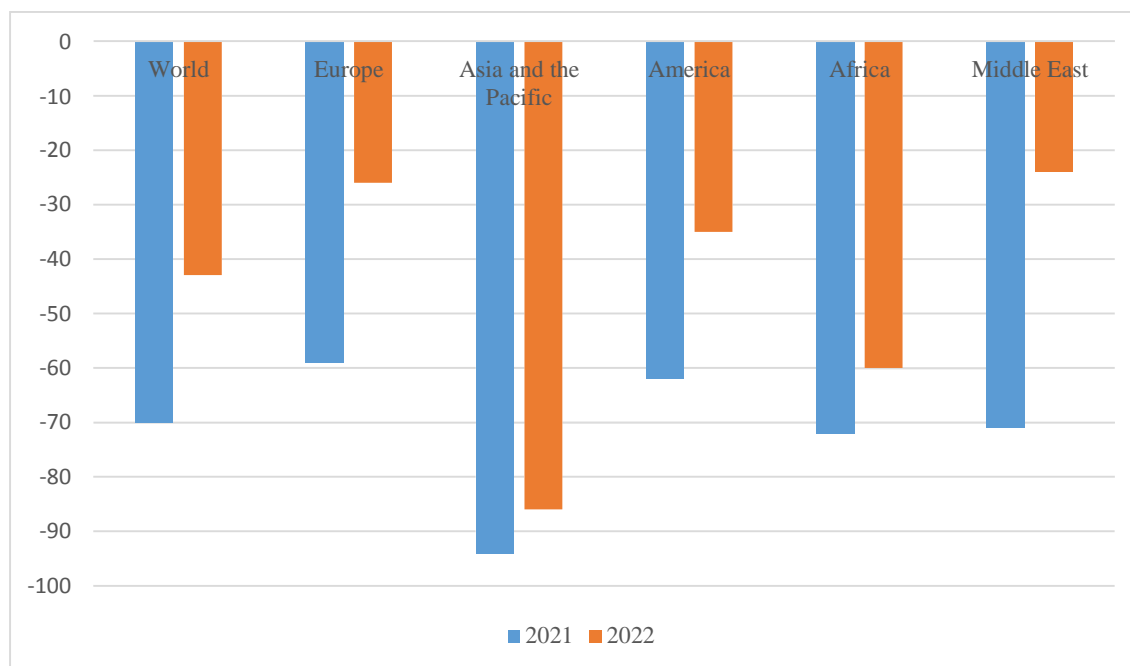
In Turkey, GDP per capita decreased by \$1,435, compared to 2019 and 2020. The national income which was \$9,150 in 2019 fell to \$7,715 in 2020. Turkey ranks the lowest among European countries with this result.

**Table 2.16.** National Revenue Per Person (\$) (Eurostat, 2022)

<b>Countries</b>	<b>2019</b>	<b>2020</b>	<b>2020/2019 % Change</b>
<b>Spain</b>	29,993	26,831	-10.54%
<b>France</b>	41,896	39,257	-6.30%
<b>Italy</b>	33,159	30,657	-7.55%
<b>England</b>	65,253	63,051	-3.37%
<b>Turkey</b>	9,150	7,715	-15.68%
<b>Greece</b>	19,569	18,168	-7.16%
<b>Hungary</b>	16,469	15,372	-6.66%

The countries increased travel restrictions to be protected from Covid-19. The United Nations World Tourism Organization (UNWTO) stated that during the months when pandemic was first seen, there was a major decline in the country's tourism revenues. The mandatory Covid-19 tests, closed country borders and lockdown measures prevented people from traveling around the world and seeing new places. Since the vaccination was provided later than expected and distributed slowly, this process is prolonged. Due to these problems in the tourism sector, UNWTO discussed with governments to revive tourism, and recommended that travel protocols between countries be planned more effectively and strongly (UNWTO, 2021).

**Figure 2.3.** International Tourist Developments by Continent (2019-2022) (UNWTO, 2022)



\* 2022 was taken as 2 quarters.

The tables below show the distribution, rate of change and total and annual totals of 5 months of foreign visits to Turkey in 2019 and 2022.

**Table 2.12.** Distribution of Foreign Visitors Visiting Turkey by Months (2019-2022 (until May) (Association of Turkish Travel Agencies), 2022)

Months	2019	2020	2021	2022
January	1,539,496	1,787,435	509,787	1,281,666
February	1,670,238	1,733,112	537,976	1,541,393
March	2,232,358	718,097	905,323	2,079,565
April	3,293,176	24,238	790,687	2,574,423
May	4,022,254	29,829	936,282	3,824,555
June	5,318,984	214,768	2,047,596	
July	6,617,380	932,927	4,360,952	
August	6,307,508	1,814,701	3,982,168	
September	5,426,818	2,203,482	3,513,543	
October	4,291,574	1,742,303	3,471,540	
November	2,190,622	833,991	1,763,982	
December	2,147,878	699,330	1,892,520	

**Table 2.13.** The Rate of Change for Foreign Visitors to Turkey Over the Years (2019-2022 (until May) (TURSAB, 2022)

Months	2021-2022 Change	2019-2022 Change
January	% 151,42	% -16,75
February	% 186,52	% -7,71
March	% 129,70	% -6,84
April	% 225,59	% -21,83
May	% 308,48	% -4,92

**Table 2.14.** Total of 5 Months and Annual Total of Foreign Visitors to Turkey (TURSAB, 2022)

Years	5 Months	Yearly
2019	12 ,757, 522	45, 058, 286
2020	4 ,992, 711	12, 734 ,213
2021	3 ,680, 055	24, 712, 266
2022	11, 301 602	

As the tables above show, there was significant decrease in the number of tourists in Turkey during pandemic. As the effects of the pandemic decreased after June 2021, exchange rate, vaccine availability etc. led to an increase in the number of tourists. This increase continues as of Q2 in 2022.

Since the beginning of the pandemic, the IMF (International Monetary Fund) recorded the expenditures by the precautionary measures imposed by governments against Covid-19. These expenditures are renewed at specific times (Tuncer, 2021). The following are the packages that developing and developing countries use to fight the outbreak and the ratio to GDP.

**Table 2.15.** Support Packages and GDP Ratio of Some Countries (Tuncer, 2021)

Countries	Ratio to GDP	Outbreak Package
Germany	%24	\$918 Billion
America	%19	\$ 4 Trillion
Argentina	% 6	\$ 27 Billion
Brazil	%12	\$222 Billion
Chinese	% 6,6	\$945 Billion
Iranian	%10	\$ 45 Billion
Sweden	%18	\$ 96.6 Billion
England	%13	\$387 Billion
Italy	%50	\$ 1 Trillion
Russia	% 5	\$ 87 Billion
Turkey	%13	\$ 91.7 Billion

According to the table above, the country with the most state support in pandemic is the United States, as mentioned earlier. Italy and Germany followed America. Among the countries given above, the least help was provided in Argentina.

In 2020, the world economy fell by about 3%, according to the analysis by the OECD. This rate has led to a reduction in all of the developed or developing countries in pandemic.

### **2.3.3. COVID 19 Impact on the Stock Markets :**

#### **2.3.3.1 Impact on global stock markets:**

The COVID-19 pandemic, declared on March 11, 2020, by the World Health Organization (WHO), had a significant impact on global financial markets, including Borsa Istanbul.

Following the announcement, stock markets worldwide experienced extreme volatility and sharp declines in stock prices. Investors' concerns about the economic consequences of the pandemic, including the potential for lockdown measures, reduced consumer spending, and disruptions to supply chains, led to a significant risk-off sentiment. Stock markets in major economies such as the United States, Germany, United Kingdom, and Brazil witnessed substantial drops in stock prices, with declines ranging from around 30% to 50%. These declines reflected the high level of uncertainty and fear among investors regarding the economic fallout from the pandemic.

However, it is important to note that not all stock markets reacted in the same way. Some markets, particularly in China, experienced a relatively quick recovery after an initial decline. This can be attributed to the effective measures implemented by the Chinese government to contain the virus and support the economy, as well as investor confidence in the country's resilience.

Overall, the stock market reactions to COVID-19 varied across countries and were influenced by factors such as the severity of the outbreak, government responses, the structure of the economy, and investor sentiment. Governments and central banks worldwide implemented fiscal stimulus packages, monetary policy measures, and regulatory interventions to mitigate the adverse effects and restore market stability. These actions aimed to provide liquidity, support affected sectors, and restore investor confidence.

In the below table, we can see a summary of the stock market reaction by country and the approximate % drop in reference stock market indices as well as stimulus actions taken by the governments to mitigate the risks of COVID 19.

**Table 2.17** Ratio drops of stock market indices of some countries after 11 March 2020 and stimulus actions by government :

Country	Stock Market Reaction	% Drop in Stock Prices (Reference Index)	Government Stimulus Measures
Germany	The German stock market, represented by DAX index, experienced significant volatility and a sharp decline in stock prices following the declaration of COVID-19 as a pandemic.	-37%	Government implemented fiscal stimulus measures, including loan programs, wage subsidies, and tax relief for businesses impacted by the pandemic. The Central Bank also took preventive actions, including liquidity injections and interest rate cuts.
United States	The U.S. stock market, represented by indices such as the S&P 500 and Dow Jones Industrial Average (DJIA), experienced extreme volatility and a significant drop in stock prices.	-34% (S&P 500), -37% (DJIA)	The U.S. government implemented several fiscal stimulus packages, including direct cash payments to individuals, increased unemployment benefits, and loans/grants for businesses. The Federal Reserve took monetary preventive measures, including interest rate cuts, quantitative easing, and liquidity support for the financial markets.
Argentina	The Argentine stock market, represented by the Merval index, experienced significant declines in stock prices due to the COVID-19 pandemic.	-48%	The Argentine government implemented fiscal measures, such as income support for vulnerable households, debt restructurings, and tax relief for affected sectors. The Central Bank provided liquidity support to banks and implemented

Country	Stock Market Reaction	% Drop in Stock Prices (Reference Index)	Government Stimulus Measures
			measures to stabilize the currency.
Brazil	The Brazilian stock market, represented by the Bovespa index, experienced high volatility and a significant drop in stock prices following the declaration of the pandemic.	-45%	The Brazilian government and the Central Bank introduced fiscal stimulus measures, including income support programs, job preservation initiatives, and credit lines for businesses.
China	The Chinese stock market, represented by indices such as the Shanghai Composite and Shenzhen Component, initially experienced a sharp decline in stock prices but recovered relatively quickly.	-14% (Shanghai Composite), -10% (Shenzhen Component)	The Chinese government implemented various fiscal stimulus measures, including infrastructure investment, tax cuts, and financial support for affected industries. The Central Bank took preventive actions, including interest rate cuts and liquidity injections.
Iran	The Iranian stock market, represented by the Tehran Stock Exchange (TSE) index, experienced significant declines in stock prices due to the COVID-19 pandemic and other economic factors.	-53%	The Iranian government implemented fiscal measures, such as cash transfers, financial support for businesses, and loans/grants for affected sectors. The Central Bank took actions to stabilize the currency and provide liquidity support to banks.

<b>Country</b>	<b>Stock Market Reaction</b>	<b>% Drop in Stock Prices (Reference Index)</b>	<b>Government Stimulus Measures</b>
Sweden	The Swedish stock market, represented by the OMX Stockholm 30 index, experienced volatility and a significant decline in stock prices following the declaration of the pandemic.	-26%	The Swedish government implemented fiscal measures, including support for businesses, temporary layoff subsidies, and loan guarantees. The Central Bank took measures to provide liquidity support to the financial system and stabilize the markets.
United Kingdom	The UK stock market, represented by the FTSE 100 index, experienced significant declines in stock prices due to the COVID-19 pandemic and global market volatility.	-35%	The UK government implemented fiscal measures, including wage subsidies, business loans/grants, and tax relief. The Bank of England took preventive actions, including interest rate cuts, quantitative easing, and support for lending to businesses.
Italy	The Italian stock market, represented by the FTSEMIB index, experienced significant declines in stock prices due to the COVID-19 pandemic and its impact on the country's economy.	-38%	The Italian government implemented fiscal measures, including income support for households, tax cuts, and financial assistance for affected businesses. The Central Bank provided liquidity support to banks and implemented measures to stabilize the financial system.
Russia	The Russian stock market, represented by the MOEX Russia index, experienced	-30%	The Russian government implemented fiscal measures, including support for affected

Country	Stock Market Reaction	% Drop in Stock Prices (Reference Index)	Government Stimulus Measures
	volatility and a significant decline in stock prices following the declaration of the pandemic.		industries, tax relief, and financial assistance for businesses. The Central Bank took preventive actions, including interest rate cuts and liquidity support to banks.
Turkey	The Turkish stock market, represented by the BIST 100 index, experienced significant declines in stock prices due to the COVID-19 pandemic and global market volatility.	-36%	The Turkish government implemented fiscal measures, including loan programs, wage subsidies, and tax relief for businesses impacted by the pandemic. The Central Bank took preventive actions, including liquidity injections and interest rate cuts.

### 2.3.3.2 Impact on Borsa İstanbul :

Initial reaction following the announcement of the pandemic, Borsa Istanbul experienced a sharp decline in stock prices, mirroring the global trend. The BIST 100 Index witnessed a substantial drop, reflecting investor concerns and uncertainty regarding the economic consequences of the pandemic.

The stock market exhibited high volatility in the subsequent months, with significant fluctuations in stock prices. The uncertainty surrounding the duration and severity of the pandemic contributed to market instability. However, as governments worldwide implemented stimulus packages and vaccination efforts gained momentum, Borsa Istanbul gradually recovered.

Certain sectors were particularly vulnerable to the impact of COVID-19, such as aviation, tourism, hospitality, and retail. These industries experienced substantial declines in stock prices due to travel restrictions, lockdown measures, and reduced consumer spending. Companies within these sectors faced significant challenges, including revenue losses and financial distress.



On the other hand, sectors such as healthcare, pharmaceuticals, and e-commerce experienced relative resilience and even growth during the pandemic. Increased demand for medical supplies and online shopping drove up stock prices in these sectors. Companies operating in the healthcare industry saw increased investment and government support to combat the pandemic.

Investors initially exhibited risk aversion in response to the pandemic. Many investors sold stocks and sought refuge in safe-haven assets such as government bonds and gold. This risk-off sentiment contributed to the decline in stock prices at Borsa Istanbul.

As the government and the Central Bank of Turkey implemented stimulus measures, including interest rate cuts and liquidity injections, investor sentiment gradually improved. The prospect of economic recovery and expectations of fiscal support helped restore confidence in the market, attracting investors back to equities.

**Monetary Policy Measures :** The Central Bank of Turkey (CBRT) introduced various monetary policy measures to mitigate the economic impact of COVID-19. These measures included the following items and the aim was to support lending and credit flow to businesses and individuals.

- **Interest Rate Cuts:** The CBRT implemented a series of interest rate cuts to provide liquidity and support economic activity. These rate cuts aimed to reduce borrowing costs for businesses and individuals, stimulating investment and consumption. The CBRT lowered its policy rate multiple times during the pandemic to ease financial conditions and support economic recovery.
- **Liquidity Injections:** The CBRT took steps to provide liquidity to financial institutions and ensure the smooth functioning of the financial system. This included open market operations, repo transactions, and liquidity auctions to inject liquidity into the market and maintain stability.
- **Reserve Requirement Ratio (RRR) Cuts:** The CBRT reduced the reserve requirement ratio, which is the portion of deposits that banks must hold as reserves, to increase liquidity in the banking system. This measure aimed to encourage lending and credit flow to businesses and individuals.
- **FX Swap Market Interventions:** The CBRT utilized foreign exchange (FX) swap transactions to manage liquidity in the foreign exchange market and stabilize the Turkish lira. These interventions aimed to maintain exchange rate stability and mitigate potential market disruptions caused by the pandemic.

### **Fiscal Stimulus Packages implemented by the Turkish Government:**

- **Economic Stability Shield Package (March 18, 2020):** The Turkish government introduced an Economic Stability Shield Package to support businesses affected by the pandemic. Key measures included:
  - a. **Tax postponements and deferrals:** Postponement of tax payments, including VAT, income tax, and social security premiums, for various sectors.
  - b. **Financial support for employees in the form of short working allowance:** Providing financial support to employees in the form of reduced working hours and unemployment benefits.

- c. Loan guarantees: Introducing loan guarantees to facilitate access to credit for businesses.
- Economic Support Package (April 10, 2020): The government introduced an additional package aimed at providing financial support to businesses and individuals impacted by COVID-19.
  - a. Cash transfer program: Providing cash transfers to low-income families and retirees.
  - b. Employment support: Offering wage support to businesses to encourage employee retention.
  - c. Sector-specific measures: Implementing measures tailored to sectors heavily affected by the pandemic, such as tourism and hospitality.

On top of these packages implemented by Turkish Government and CBRT, Borsa Istanbul implemented temporary regulations to manage the impact of COVID-19 on the stock market. These measures aimed to increase transparency, prevent market manipulation, and ensure the fair treatment of investors during the pandemic-induced market volatility.

In summary, COVID-19 pandemic had a significant impact on Borsa Istanbul. Initially, stock prices experienced a sharp decline, reflecting the heightened uncertainty and risk aversion among investors. However, as the government implemented stimulus measures and vaccination efforts progressed, investor sentiment improved, leading to market recovery. Certain sectors, such as aviation and tourism, suffered severe losses, while others, like healthcare and e-commerce, demonstrated resilience. Government interventions played a crucial role in mitigating the impact of the pandemic on the stock market, providing monetary and fiscal support to affected industries.

## CHAPTER 3. METHOD

**Literature Review:** There is an increasing content of literature analyzing significant effects of COVID-19 outbreak on financial markets. Some studies focus on the relation between case and death numbers and financial indicators. Some studies examine the impacts of public announcements or government policy measures on financial markets.

The method used in this study is an event study approach. This approach is based on determination of the significance of differences between actual and expected returns of stock values calculated based on industry specific stock market indices of Borsa Istanbul.

In other words, the event study method measures the impact of a particular event on the firm's value. First stage of the method is the estimation of market model, which is the regression of stock returns against the market returns. It starts with a regression of expected share returns (fair value) with market returns. Then the beta coefficient obtained from the regression are used to calculate the expected returns.

In this study, the return ( $R_{it}$ ) of each index was calculated using Equation (1).

**Equation 1:**

$$R_{it} = \ln ( I_{it} \div I_{i(t-1)})$$

Here,  $I_{it}$  is the value of the index  $i$  at date  $t$ , and  $I_{i(t-1)}$  is the previous transaction of the index  $i$ .  $I_{i(t-1)}$  represents its historical value.  $\ln$  is the natural logarithmic function.

**Equation 2 and 3:**

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon$$

$$E(R)_{it} = \alpha_i + \beta_i R_{mt}$$

BIST-100 index was taken to represent the market return ( $R_{mt}$ ) and a dataset of 200-day was used to calculate the constant term and  $\beta$  coefficients obtained by regression of the prediction window which were then used to calculate expected returns (Equation (3)). In this study, with the same logic at Capital Asset Pricing Model (CAPM), the constant term (alpha) which represents the asset's performance relative to what is predicted by the model, is taken as zero. This means that, the expected return of an asset is solely determined by its beta and the expected return of the market which is BIST 100 Index.

Difference between actual and expected returns are called "abnormal returns (AR)". Anomalies, which show the difference between the realized returns and the expected returns are obtained by the formula below. (Equation 4)

**Equation 4:**

$$AR_{it} = R_{it} - E(R)_{it}$$

To determine the significance of the AR (Abnormal Return) values, a statistical test was performed. We have used t-test for this purpose. This test compares the mean of a sample (in our case, the AR values) to a hypothetical population mean to determine if there is a significant difference. In our context, the AR values for different sectors are compared to an expected or hypothesized value of zero. The null hypothesis is that there is no significant difference between the mean AR and zero, indicating that the returns are not abnormal or unexpected. The alternative hypothesis is that there is a significant difference between the mean AR and zero, indicating abnormal returns.

The t-test calculates a t-value, which represents the difference between the sample mean and the hypothesized population mean in terms of standard error. The t-value is then compared to a critical value from the t-distribution, taking into account the desired level of significance (typically 0.05 or 0.01). If the calculated t-value exceeds the critical

value, the null hypothesis is rejected, and it is concluded that the AR values are significantly different from zero.

The p-value is a measure of the strength of evidence against the null hypothesis. It represents the probability of observing a t-value as extreme or more extreme than the one calculated, assuming the null hypothesis is true. A smaller p-value indicates stronger evidence against the null hypothesis. Typically, if the p-value is less than the chosen significance level (e.g., 0.05), the null hypothesis is rejected. To determine the exact p-values for the AR values in our dataset, the t-test was performed on each sector's AR values separately, comparing them to a hypothesized mean of zero where we can see the results in the table below.

<b>Sector</b>	<b>Hypothesized Mean</b>	<b>t-value</b>	<b>p-value</b>
XUHIZ	0	0.7086	0.4875
XUSIN	0	-0.7683	0.4528
XBLSM	0	-1.3373	0.1969
XTRZM	0	-0.5808	0.5676
XBANK	0	-0.9306	0.3645
XUTEK	0	0.1568	0.8779
XGIDA	0	-1.5743	0.1329
XULAS	0	-0.4445	0.6617

Based on the t-test results, none of the p-values for the sectors' AR values are less than the commonly used significance level of 0.05. Therefore, we cannot reject the null hypothesis that the mean AR values are not significantly different from zero for any sector.

In our study, the first event day (important pandemic related event) is taken as 11 March 2020 on which the first case confirmed in Turkey meanwhile WHO declared the COVID-19 outbreak as a pandemic. This analysis forms the basis of this thesis study. The other two event days are included at the end of the research in order to compare how strong the stock market reaction to COVID 19 vs another critical event like the earthquake.

The second event day therefore is taken as 17 August 1999 which is the date of Marmara earthquake which centered on the city of Izmit and was the most deadliest earthquake in Turkey history. It caused extensive damage to buildings, infrastructure, and the economy. This earthquake also had a significant impact on the economy, with losses estimated at over \$5 billion.

The third event day is selected as 6 February 2023 which is the date of Kahramanmaraş earthquake which caused destruction in Kahramanmaraş and also in at least 10 provinces including Syria, Kilis, Diyarbakır, Adana, Osmaniye, Gaziantep, Şanlıurfa, Adıyaman, Malatya and Hatay. This earthquake was the biggest earthquake after Marmara earthquake in 1999.

For the first event day, 11 March 2020, a dataset covering the data between 1 May 2019 and 4 April 2020 were created. For the second event day, 17 August 1999, a dataset covering the date between 1 Jan 2019 and 31 October 2019 were created.

For the third event day, 6 February 2023, a dataset covering the data between 1 May 2022 and 28 February 2023 were created.

All data consists of returns of 8 sectoral indices and BIST-100 index. For the second event day, returns of 6 sectoral indices were analysed as data for Teconology index (XUTEK) and IT index (XBLSM) were not available at that time.

Obtained from Borsa Istanbul (<https://datastore.borsaistanbul.com/>).

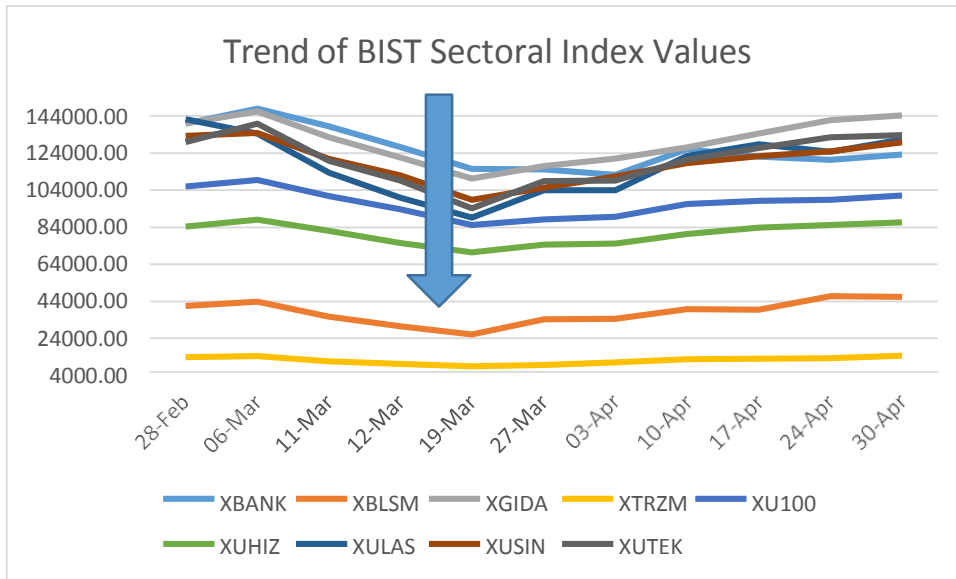
Examined indices and the number of companies they cover are shown below.

<b>Index Code</b>	<b>Index Name</b>	<b>Number of Companies</b>	<b>Index Value as at 30 April 2020</b>
XUHİZ	BİST HİZMETLER	66	869.29
XUSIN	BİST SİNAİ	159	1298.2
XGIDA	BİST GIDA	23	1442.41
XBLSM	BİST BİLİŞİM	18	461.26
XTRZM	BİST TURİZM	8	128.3
XBANK	BİST BANKA	12	1234.27
XUTEK	BİST TEKNOLOJİ	19	1286.8
XULAS	BİST ULAŞTIRMA	8	1289.3

## CHAPTER 4. FINDINGS

### 4.1 : Impact of COVID 19 on Borsa İstanbul Sectoral Indices (1st event day of 11 March 2020) :

Figure 2.4 : Weekly pattern of BİST Sectoral Indices between 28.02.2020 and 30 April 2020.



We can clearly see a sharp drop in all sectoral indices after the event day of 11 March 2020 which start to recover in the following weeks.

**Table 2.17 : AR Values of sectoral indices for the event day of 11 March 2020**

	XUHIZ	XUSIN	XBLSM	XTRZM	XBANK	XUTEK	XGIDA	XULAS
01.04.2020	0.0050	0.0140	-0.0250	0.0630	-0.0160	-0.0240	0.0110	0.0060
31.03.2020	0.0050	0.0070	0.0270	0.0630	-0.0110	0.0040	0.0010	0.0310
30.03.2020	-0.0050	0.0050	-0.0130	0.0310	0.0070	0.0000	0.0040	-0.0270
27.03.2020	-0.0120	-0.0020	-0.0100	0.0140	0.0280	-0.0050	-0.0100	0.0300
26.03.2020	0.0070	0.0000	0.0330	0.0420	-0.0040	0.0110	-0.0260	0.0300
25.03.2020	-0.0010	0.0090	0.0660	0.0090	-0.0130	0.0400	0.0260	0.0640
24.03.2020	-0.0110	0.0170	0.0410	0.0050	-0.0080	0.0280	0.0000	0.0100
23.03.2020	0.0380	-0.0040	0.0640	-0.0470	-0.0340	0.0130	0.0160	-0.0200
20.03.2020	0.0070	0.0160	0.0320	0.0230	-0.0210	0.0130	0.0200	0.0010
19.03.2020	0.0100	0.0040	0.0040	-0.0260	-0.0270	-0.0170	0.0300	-0.0070
18.03.2020	0.0240	-0.0050	-0.0070	-0.0190	-0.0160	0.0020	0.0000	-0.0090
17.03.2020	-0.0080	-0.0300	-0.0310	-0.0570	0.0420	-0.0280	-0.0360	-0.0330
16.03.2020	-0.0070	-0.0210	-0.0290	-0.0390	0.0350	-0.0110	-0.0230	-0.0090
13.03.2020	-0.0150	0.0000	-0.0270	0.0220	0.0060	0.0070	0.0100	0.0530
12.03.2020	-0.0260	-0.0170	-0.0920	-0.1020	0.0250	-0.0120	-0.0240	-0.0430
11.03.2020	0.0230	-0.0200	-0.0560	-0.0760	0.0070	-0.0090	0.0010	-0.0410
10.03.2020	-0.0190	-0.0100	-0.0540	-0.0520	0.0290	-0.0440	-0.0130	-0.0230
09.03.2020	-0.0090	-0.0160	-0.0330	-0.0690	0.0160	-0.0120	-0.0180	-0.0110
06.03.2020	0.0010	-0.0010	0.0010	-0.0160	0.0030	0.0070	0.0160	-0.0260
05.03.2020	0.0180	0.0020	0.0010	0.0000	-0.0180	0.0040	0.0080	-0.0180
04.03.2020	0.0000	-0.0150	-0.0240	-0.0230	0.0170	-0.0200	-0.0010	-0.0400
03.03.2020	0.0030	-0.0080	0.0050	0.0000	0.0070	0.0240	-0.0210	-0.0300
02.03.2020	-0.0070	0.0050	0.0250	0.0340	0.0000	0.0160	0.0100	-0.0500



February 2020 was the month where the speed of the pandemic and number of cases and deaths gradually increased in all countries. No COVID case was encountered yet in Turkey at that time. On 10<sup>th</sup> of January 2020, a scientific committee was established in Turkey by Ministry of Health in order to prevent the spread of COVID 19 to Turkey through the entry of foreign visitors. During March 2020, we can observe fluctuations in many stock markets as a result of developments in international markets and preventive actions taken by government including declaration of support packages.

After the event day of this study 11 March 2020, increase in systematic risks could be observed in all countries. We could observe reasonable AR values at BIST sectoral indices before 9<sup>th</sup> of March due to increased disinfection activities by the government. Especially the crash of US Stock Market on 9<sup>th</sup> of March which lead to a strong impact in financial markets globally also had an impact on Turkish Stock Market. On 9<sup>th</sup> and 10<sup>th</sup> of March, we observed significant value losses in all BIST sectoral indices. On 9<sup>th</sup> of March 2020, we observe meaningful negative AR values in BIST Sınai, BIST Turizm and BIST Bilişim indices, we see that as of 10 March 2020, BIST Teknoloji and BIST Hizmetler are included to this group as well. On the other hand, positive AR values at BIST Banka Index are differentiating from the overall market trend and other sectoral indices.

After 9 March 2020 which was called the Black Monday, the breaking point for COVID 19 pandemic in Turkey was 11 March 2020. The first COVID 19 case was confirmed in Turkey on 11<sup>th</sup> of March. On the same day, WHO declared COVID 19 as an official pandemic situation and US President, Donald Trump applied travel bans from 26 European countries into US. The markets reacted fast to all these developments that happened on the same day (11<sup>th</sup> of March). Therefore, this date was selected as the event day of this study.

It is observed that market reactions were different on sectoral basis. At BIST Ulaştırma, BIST Sınai, BIST Turizm and BIST Bilişim, we observed negative AR values whereas we observed positive AR values at BIST Banka and BIST Hizmetler Index.

12 March 2020 was another key date where the stock market was subject to strong reactions. On this date, as a result of the meeting chaired by the Turkish President, a series of measures were announced, including the suspension of face-to-face training. A second shock wave emerged in global markets and this date was recognized in history as "Black

Thursday". On March 12 (together with March 16), the biggest drop of March was recorded in all indices. The daily loss was around 15% in Tourism and IT indices and 12% in Transportation. The Bank index with a positive AR value had a depreciation of 8.4%. On March 13, a slight recovery was observed in the indices. In Transportaion Index, a positive AR value was observed.

In the following days, additional restrictions and measures were announced. The stock markets in the US crashed once again. Along with Black Monday, there was again depreciation in indices on 16th and 17th of March. The reduction of interest rates by 100 basis points to 9.75% on March 17 by the Central Bank of Turkey was not effective enough. The index which provided positive AR on March 17 was the Bank Index. On March 18, after the Coordination Meeting to combat the Coronavirus, a series of measures under the name of the Economic Stability Shield were announced by the Turkish President. With this package of measures, partial recovery was observed in indices after March 19 th. It is seen that, positive AR values provided by the Bank index until this date started to turn negative. Despite the tax advantages brought to accommodation and domestic air transportation, the decrease in transportation and tourism indices continued on 19 th of March. Despite the decrease in index values, the fact that negative AR values were not statistically significant may indicate that the sectors may have perceived these packages partially positively.

After the slight increase in the indices on March 20, it was seen that all indices increased again on March 24. Considering the AR values, the value increase in the Technology, Industrial and IT sectors is higher than expected , while the Services index was below expectations. It is also thought that the launch of the "Short Working Allowance" on March 26 had a positive impact on the returns of the sectors that were more impacted by the pandemic. On this date, positive AR values were seen in the Transport, Tourism and IT indices. Negative AR value occurred only in the Food index. The fluctuations in indices continued until the end of the month. On the other hand, positive AR values draw attention in the Transport and Tourism indices. This can be interpreted as a positive reaction to the downward trend in the number of cases and deaths, as well as a positive perception of the measures and supports by the government.

**4.2 : Impact of the earthquakes on Borsa İstanbul Sectoral Indices (2 nd event day of 17 August 1999 and 3rd event day of 6 February 2023) :**

**Table 2.18. AR Values of sectoral indices for the event day of 17 August 1999**

Date	<b>XBANK</b> AR	<b>XGIDA</b> AR	<b>XTRZM</b> AR	<b>XUHIZ</b> AR	<b>XULAS</b> AR	<b>XUSIN</b> AR
02.08.1999	0.017	0.010	-0.031	0.013	-0.042	-0.005
03.08.1999	-0.006	-0.013	-0.002	-0.020	0.030	0.007
04.08.1999	0.000	-0.001	-0.021	-0.009	-0.022	0.004
05.08.1999	0.012	-0.005	-0.033	0.001	0.015	-0.002
06.08.1999	-0.004	-0.002	0.022	0.010	-0.003	0.003
09.08.1999	-0.039	0.001	0.010	0.002	0.032	0.019
10.08.1999	0.004	0.015	0.018	-0.002	-0.014	0.001
11.08.1999	0.007	-0.014	0.019	0.003	-0.011	0.001
12.08.1999	0.005	0.002	-0.025	0.012	0.003	-0.002
13.08.1999	-0.020	-0.008	0.005	-0.001	0.014	0.007
16.08.1999	0.007	0.023	-0.016	0.002	0.016	-0.008
26.08.1999	0.051	-0.074	-0.149	0.034	-0.091	-0.008
27.08.1999	-0.020	0.037	-0.017	0.012	-0.027	0.033
31.08.1999	0.021	-0.004	-0.042	-0.019	-0.053	0.011
01.09.1999	-0.022	0.007	0.007	0.021	0.044	0.009
02.09.1999	-0.005	0.012	0.020	-0.001	0.061	0.001
03.09.1999	-0.020	0.011	0.061	-0.011	0.003	0.013
06.09.1999	-0.039	0.013	0.043	-0.004	0.037	0.003
07.09.1999	-0.003	-0.018	-0.055	-0.011	-0.022	0.002
08.09.1999	-0.038	0.027	0.028	0.024	0.089	0.025
09.09.1999	-0.021	0.018	-0.005	0.017	0.017	0.022
10.09.1999	-0.019	0.022	0.022	-0.021	-0.022	0.023
13.09.1999	0.013	0.006	-0.022	-0.004	-0.025	-0.007
14.09.1999	-0.007	0.017	0.021	0.008	0.028	0.003
15.09.1999	0.005	0.028	-0.042	0.002	-0.012	-0.009
16.09.1999	-0.008	0.028	0.020	0.012	0.019	0.006
17.09.1999	-0.009	-0.002	0.000	0.012	-0.009	0.008
20.09.1999	-0.009	-0.011	0.072	-0.001	0.001	0.014
21.09.1999	0.001	-0.002	0.035	-0.008	-0.005	0.003
22.09.1999	0.010	-0.009	0.002	-0.004	0.000	-0.007
23.09.1999	-0.004	-0.001	-0.009	-0.002	0.023	0.001
24.09.1999	0.007	0.007	-0.055	0.006	0.008	-0.008
27.09.1999	0.004	-0.016	-0.001	-0.007	-0.013	-0.001
28.09.1999	0.012	-0.008	0.006	0.013	-0.026	-0.018
29.09.1999	0.003	-0.002	-0.014	0.001	0.011	0.001
30.09.1999	0.000	0.018	-0.002	-0.009	0.005	0.003

The impact of the earthquake in Turkey on 17 August 1999, on sectoral stock market indices at Borsa Istanbul is analyzed in a similar way using the event study method. The AR values for six sectoral indices - XBANK, XGIDA, XTRZM, XUHIZ, XULAS, and XUSIN - are obtained and presented in the table above. In year 1999, Technology Index (XUTEK) and IT Index (XBLSM) were not yet available at Borsa İstanbul and could not be analyzed for the purposes of this study.

Before the earthquake, the indices showed mixed behavior with no clear trend. However, after the earthquake, negative impact was observed in the sectoral indices. On August 26, 1999, the indices showed a sharp decline, with XBANK, XGIDA, XTRZM, XUHIZ, XULAS, and XUSIN recording AR values of 0.051, -0.074, -0.149, 0.034, -0.091, and -0.008, respectively.

In the following days, the indices showed mixed behavior with occasional spikes and declines. For example, on August 27, 1999, the indices recovered slightly, with XGIDA and XUSIN recording positive AR values of 0.037 and 0.033, respectively. However, on August 31, 1999, the indices decreased again, with XULAS and XUSIN recording negative AR values of -0.053 and 0.011, respectively.

Overall, the earthquake had a negative impact on the sectoral stock market indices as we observed a sharp decline immediately after the earthquake, followed by mixed behavior in the following days. Then, the government and other regulatory bodies took several steps to stabilize the markets and restore investor confidence which helped to stabilize the stock market and prevent a prolonged sell-off. The BIST 100 Index dropped 14% in the week following the earthquake but recovered within a month time.

**Table 2.19. AR Values of sectoral indices for the event day of 6 February 2023**

Date	XUHIZ	XUSIN	XBLSM	XTRZM	XBANK	XUTEK	XGIDA	XULAS
23/01/2023	0.003	0.005	-0.027	-0.041	0.010	-0.010	0.002	0.050
24/01/2023	0.003	0.002	-0.013	-0.025	-0.010	0.019	-0.014	0.015
25/01/2023	0.010	0.008	-0.019	0.006	-0.021	-0.006	-0.007	0.065
26/01/2023	0.008	0.013	0.003	0.007	-0.024	0.009	0.009	0.043
27/01/2023	-0.007	0.009	-0.017	-0.018	-0.022	0.008	-0.018	0.023
30/01/2023	-0.002	0.014	0.007	-0.005	0.018	-0.001	0.002	0.030
31/01/2023	-0.006	0.008	-0.010	0.015	0.022	-0.005	0.001	0.041
01/02/2023	0.003	0.039	-0.036	-0.031	-0.034	-0.002	-0.008	0.156
02/02/2023	-0.006	-0.006	-0.023	0.000	-0.029	-0.015	-0.028	-0.007
03/02/2023	0.003	-0.041	0.035	0.016	0.038	0.005	0.005	-0.125
06/02/2023	0.001	0.010	-0.011	-0.026	-0.010	0.020	0.006	0.029
07/02/2023	-0.007	0.060	-0.055	-0.043	-0.007	0.005	-0.005	0.238
08/02/2023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15/02/2023	0.000	-0.057	0.046	0.045	0.011	-0.019	0.007	-0.256
16/02/2023	-0.034	0.010	-0.061	-0.047	0.008	-0.050	-0.066	-0.053
17/02/2023	-0.008	0.008	0.000	-0.002	-0.006	-0.016	-0.011	-0.009
20/02/2023	-0.014	0.002	0.023	0.026	-0.019	-0.027	-0.007	-0.083
21/02/2023	-0.005	0.013	0.020	-0.003	-0.014	0.006	0.017	-0.026
22/02/2023	0.017	-0.010	0.000	-0.027	0.024	0.023	0.000	0.051
23/02/2023	0.013	-0.007	0.021	0.006	0.002	0.001	0.014	-0.009
24/02/2023	-0.006	0.013	0.005	-0.001	-0.013	-0.003	0.012	0.013
27/02/2023	-0.001	-0.029	-0.011	0.021	0.046	-0.009	-0.005	-0.046
28/02/2023	0.005	-0.006	0.008	0.007	-0.007	-0.007	0.017	-0.022

In January 2023, before the earthquake and between 23 Jan 2023 to 6 th of February, we observe positive and significant AR values at Transportation Index and positive AR values at Industrial Index apart from 2nd and 3rd of February. On the other hand, we observe negative and significant AR values in general at Banking and IT Indices. We observe no significant AR values at Service, Technology and Food Indices. At Tourism Index, we see a mixture. On 23 rd and 24 th of January, we see negative AR values which are then recovered but we still observe negative AR values on some days like 1<sup>st</sup> and 6<sup>th</sup> of February. Overall, we can say that, AR values for most sectoral indices have generally been decreasing over the period from 28 January to 6 February 2023. This suggests a general trend of declining stock prices at Borsa Istanbul before the earthquake.

During those weeks, it was known that, investors were searching for better returns to protect themselves from high inflation and low interest rates and this situation together with flat exchange rates made stocks traded at Borsa İstanbul as a good investment alternative. The main reason reason for the negative AR values at banking index in this period which even continued till the end of February could be the upper limit of interest on “Currency Protected Deposits (KKM)”. The Central Bank fixed upper limit of interest rate for the currency protected deposits by a maximum of 3 points above the policy interest rate. Due to exchange rates which remained flat, the amount of KKM decreased to 1.3 trillion TL.

After our event window, as of 31 st of March 2023, Central Bank of Turkey announced to abolish the upper limit of interest on currency protected deposits (KKM). This was interpreted as a “disguised interest rate increase”. But this was a necessary move. However, the continuous drop in inflation and the increase in deposit interest rates were expected to reduce the “inflation-interest gap” even more. The abolition of the upper limit of interest on currency-protected deposits and the increasing return on deposits and currency-protected deposits could lead to stock sales at Borsa Istanbul but our event study does not cover this period. On the other hand, the application of upper interest limit on currency proted deposits explains the negative AR values in banking index in general in our event window between 23 rd of Jan 2023 and 28 th February 2023 which is before the announcement of abolishment of upper interest rate application by Central Bank as a

preventive action to support the banking system. With this decision, Central Bank signaled that, it is willing to allow market forces to determine the interest rates offered by banks to its depositors. This would encourage banks to offer higher interest rates on currency protected deposits and attract more deposits and increase the liquidity in the banking system.

The positive AR values in Transportation Index is attributable to the expectation that high inflation will be reflected as an increase in profits on the balance sheets of listed companies. Although inflation puts pressure on households, it also creates an expectation that company revenues will increase. This may reflect positively on share performances in TL terms.

After the earthquake, the only effected sectoral index was transportation index where the good trend with significant and positive AR values before the earthquake turned to the opposite way and started to generate negative AR values especially after 15 th of Feb which continued till the end of the month. After 6 February 2023, we observed a daily reaction in almost all sectoral indices with negative AR values. The reaction was daily and we could observe a recovery after few days. For example, service index reacted with negative AR values but started to recover after 21 st of February. Technology and Food Indices also reacted with negative AR values right after the earthquake but started to recover after 20 th of February. Industrial Index was less impacted from the earthquake, we observed negative AR values after the earthquake but this was for short term and the index values recovered after 16 th of February. Tourism Index also generated a negative AR value right after the earthquake for few days but turned back to its mixed trend just like before the earthquake. Banking and IT Index were the least impacted indices from the earthquake apart from their reaction on 7 th of February with negative AR values and they recovered immediately after one day and turned back to their trend before the earthquake.

## **CHAPTER 5 CONCLUSION :**

### **5.1 Impact of COVID 19 on Borsa İstanbul Sectoral Indices (1st event day of 11 March 2020):**

Results suggest that responses of indices to the pandemic-related event on 11 March 2020 differed across the industries. Technology, Transportation, Tourism and IT are concluded to be the most responsive sectors. Since the income and profit losses in Transportation and Tourism caused by lockdowns and social distancing rules were huge, these sectors were the most sensitive to the COVID 19 outbreak. Sensitivity of Technology and IT sectors was also high due to their external dependencies.

On the other hand, positive results are observed with regard to AR values in Banking Industry during the downturn period. Even generating negative actual returns during March, responses of banking sector to the event day of 11 March 2020 is lower than expected. Despite the decreasing profits and increasing credit risks, performance of Banking index is better than expected during the stock market crash.

When looking at economic implications, we can say that, COVID-19 outbreak had a significant impact on Borsa İstanbul. Like other stock markets, BİST 100 and sectoral indices experienced a significant decline in response to the pandemic followed by a more prolonged recovery period in comparison to the recovery period after earthquakes. After this outbreak, great transformations have begun to take place from the daily life of individuals and the way companies do business. In terms of the business world, the most distinctive feature of this outbreak was a wide-scale recession and shutdowns. There had been serious contractions in business areas that do not have flexible working hours and remote working opportunities. As the news related to the pandemic was effective on investment decisions by increasing the anxiety among investors (Baig et al., 2020) and the spread effect caused by the economic connections established between companies as customers or suppliers (Mazur et al. 2020), huge losses were experienced in the entire economy and Borsa İstanbul without being limited to certain sectors and which are difficult to estimate as an exact figure. (Please refer to Section 2.3.2 to see our analysis on the economic impacts of COVID 19 outbreak.)



## **5.2 Impact of the earthquakes on Borsa İstanbul Sectoral Indices (2 nd event day of 17 August 1999 and 3rd event day of 6 February 2023) :**

After Kahramanmaraş earthquake, the only effected sectoral index was transportation index where the good trend with significant and positive AR values before the earthquake turned to the opposite way and started to generate negative AR values. After the earthquake, we observed a daily reaction in almost all sectoral indices with negative AR values but the reaction was daily and we could observe recovery after few days. Banking and IT Index were the least impacted indices from the earthquake apart from their reaction on 7 th of February with negative AR values and they recovered immediately after one day and turned back to their trend before the earthquake. Finally, we can say that, apart from Transportation index, other sectoral indices were resilient to the earthquake's impact. On the other hand, we observed a slightly stronger and longer reaction from the stock market to 17 August 1999 earthquake 23 years ago where we observed that sectoral stock market indices experienced a sharp decline immediately after the earthquake, followed by mixed behavior in the following days. A recovery could be observed in all market indices within one month after the steps taken by government to stabilize the stock market.

On the first trading day after the earthquake, Borsa İstanbul was closed, and it remained closed for five business days. When it reopened on August 25, 1999, BIST 100 Index, which is the main index of the Istanbul Stock Exchange, fell by 9.55% in a single day. The main reason for the decline in the BIST 100 Index was the panic selling by individual investors who feared that the earthquake would have a long-term negative impact on the economy. Several measures were taken by the government to stabilize the stock market and restore investor confidence as listed below:

- **Emergency Interest Rate Cut:** In an effort to stabilize the stock market, the Central Bank of Turkey (CBT) cut interest rates by 500 basis points within a week of the earthquake.
- **Financial support for companies:** The government provided financial support to the companies affected by the earthquake to help them recover and resume their operations.

- Relief measures for investors: The Capital Markets Board of Turkey (CMB) announced relief measures for investors, such as the suspension of margin calls and the extension of deadlines for submitting financial reports.
- Improved building codes: The government introduced new building codes and regulations to improve the seismic resilience of buildings in earthquake-prone areas.

These measures helped to stabilize the stock market and prevent a prolonged sell-off. The BIST 100 index recovered within a month.

When we compare the results of the two earthquakes with the results of the COVID related event on 11 th of March, we observe that sectoral reactions and their magnitude were different at these three events. For the first event day of 11 March 2020, Technology, Transportation, Tourism, and IT indices were the most sensitive indices against this COVID-19 outbreak whereas Transportation was the only sensitive index against the Kahramanmaraş earthquake. When analyzing 1999 Marmara earthquake, Tourism and Transportation indices were the most sensitive. The biggest similarity between the reactions against all these three events was the fact that, banking sector index was the least impacted index from the events. Against, 11 th of March, banking index generated significant AR values but coefficients were opposite to the aspect of the event.

Against 17 August 1999, there was a significant positive AR value for XBANK on 26 August 1999, which is more than a week after the earthquake. Therefore, it is unlikely that this value could be attributed to the earthquake. Similarly, there were no particularly significant AR values for XBANK around the time of the earthquake in the days leading up to or immediately following 17 August 1999. Therefore, we can say that Marmara earthquake did not have a significant impact on the banking index.

Against, 6 th of February 2023 Kahramanmaraş earthquake, banking index did not also react strongly. The AR value for XBANK on 6 February is -0.010, which is not a significant deviation from the AR values of the preceding and following days. Additionally, the AR values for XBANK during the period of 6 February to 28 February do not show any remarkable pattern or deviation from the AR values of the other indices

during the same period. Therefore, this earthquake did not also have a significant impact on the banking index.

While analyzing the AR values we should keep in mind that, similar to Marmara earthquake, Borsa İstanbul was also closed after Kahramanmaraş earthquake and was reopened on 15 February 2023. During this period, a series of measures were announced to prevent the turmoil in the stock markets which are listed below.

- The Ministry of Treasury and Finance announced to provide tax exemption to increase the share repurchases of companies traded at Borsa Istanbul. In this context, listed companies were able to repurchase their shares without paying withholding tax, which is 15 percent. Share repurchases allow companies to return value to their shareholders by reducing the number of shares outstanding, which can increase the value of the remaining shares.
- Turkey Wealth Fund intervened and decided to transfer capital to Price Stability Fund which is under its own scope, in order to buy shares during periods of high fluctuations in the stock market. The aim was to support the stability of the stock market and protect it from volatility and panic among investors, which could cause a decline in stock prices. This intervention sent a positive signal to investors, demonstrating that the government was committed to supporting the stock market.
- After the earthquake, considering the potential market volatility, short selling transactions were prohibited in order to avoid a rapid decline in stock prices.
- New rules were implemented regarding share repurchases

These measures were helpful and caused the recovery of AR values in most sectoral indices after 17 Feb 2023 including Industrial, Tourism and Food Index.

The results from this event study suggest that, compared to a COVID 19 related event, stock market reaction to Kahramanmaraş earthquake on 6 February 2023 lasted for few days and most sectoral indices were recovered shortly after the reopening of Borsa İstanbul on 15 th of February and no abnormal damage occurred at Borsa İstanbul due to earthquake. Statistically, an abnormal damage occurred only on 7 th of February where most sectoral indices reacted with negative AR values. Although abnormal returns could

be observed again on some sectoral indices on 15 th and 16 th of February, due to the measures taken listed above, huge losses at the stock market were prevented.

When we analyze the impact of Marmara earthquake on 17 August 1999, it had a significant impact on Turkey's economy and financial markets including Borsa İstanbul. The disaster caused widespread damage to infrastructure, buildings, and other physical assets, and many people lost their lives or were injured. The economic impact of the earthquake was felt in many sectors, including construction, tourism, and transportation. Despite the stock market reaction was stronger and recovery of sectoral indices took longer time compared to Kahramanmaraş earthquake, the measures taken by government and the Central Bank of Turkey helped to prevent a sharp decline in share prices. While the stock market experienced some volatility in the days following the earthquake, there was again no abnormal damage at Borsa İstanbul due to the earthquake and we could observe recovery in sectoral indices within one month.

In this context, as the results of our reserach study revealed that measures taken by government after both earthquakes were helpful and prevented huge losses at the stock market, we want to conclude our thesis study by our recomendations for other shortterm and long term measures to be considered in future to protect the stock market from a natural disaster or an extraordinary event.

#### **Short term measures:**

- The stop of derivative transactions until the announcement of preventive measures. Derivative transactions, such as futures and options, can be highly complex and risky. If left unchecked, these transactions can lead to volatility in the stock market.
- Increase of the minimum shareholding obligation of state contribution funds in the private pension system from 10% to 30%. This means that, state contribution funds will have to invest a higher proportion of their assets in the private pension system in order to boost the development of the private pension system and provide more retirement saving options for individuals. The government will send a signal that it is committed to promote long-term savings and financial security.
- Reducing the bureaucratic difficulties in share repurchases and ensuring that the repurchased shares cannot be resold within 30 days. Preventing reselling of

repurchased shares within 30 days is to discourage short-term speculation and promote long-term investment in listed companies.

- Announcement to the public that order cancellation, price deterioration and quantity reduction will not be allowed in the stock market. By announcing, these practices will not be allowed in the stock market, the aim is to prevent unfair trading practices and promote market stability.

**Long term measures:**

- Industrialization should be directed to places where there is no earthquake risk. The infrastructure of existing industrial zones should also be strengthened.
- Migration waves that occurred after the earthquake should be directed and disciplined to provide employment for industrialization. Although listed companies are clustered in a certain region, their factories can be established in less risky areas.
- The families of all customers who lost their lives in earthquakes should be immediately contacted and their loans and credit card debts should be cleared.
- All financial institutions and organizations that declare consistently high profits; should provide interest-free loans and funding to companies in the region that were severely affected by the earthquake.
- Abandonment of public receivables, such as taxes, in order to strengthen the small, medium and large enterprises in the provinces that were severely damaged by the earthquake.

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