Czech University of Life Sciences Prague

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Bachelor Thesis

Impact of Covid-19 to economy of the European Union

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Impact of Covid-19 to the economy of EU

Objectives of thesis

The primary objective of the work is to research the impact of Covid-19 on the economy of the European Union. The originality of the work lies in analyzing and determining the impact of the Pandemic on most major economic sectors of the EU such as GDP, Inflation rate, Import-Export, Unemployment, and Government debt.

Methodology

The research methodology used in this bachelor thesis is divided into two majors parts. The theoretical part consists of a compilation of articles found in literature and research papers that provides a clear understanding and vision of past Pandemics and their effects on humanity and the economy. The practical part of the thesis consists of a monthly and quarterly comparison of data gathered from reliable sources. Research Methods used in work – Index calculation, percentage calculation, deduction, and comparison.

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Recommended information sources

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Declaration

I declare that I have worked on my bachelor thesis titled "Impact of Covid-19 to economy of the European Union" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 15th of March _____

Shukhrat Saidmurodov

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Impact of Covid-19 to economy of European Union

Abstract

The global pandemic of Coronavirus 2019 (Covid-19) not only caused illnesses and fatalities but also caused havoc on the global economy on a scale not seen since at least the Great Depression. The outbreak has the potential to destroy individual livelihoods, enterprises, markets, and economies as a whole. The mining sector is not resistant to these impacts, and the crisis has the potential to have serious short, medium, and long-term implications for economic industries.

Before researching the impacts of the pandemic it is important to know the history and potential implications of the outbreaks, and this thesis provides general knowledge about pandemics and their effect on humanity and the economy. Furthermore, the thesis delivers an understanding of these impacts and analysing their significance for the industry.

The main goal of the thesis to research the economic impacts of Covid-19 on the economy of the European Union. The thesis examines how the outbreak has impacted economic sections such as Unemployment, Inflation, Import-Export, GDP, and Governmental Debt based on reliable data collected from Eurostat and UN Comtrade database, and it will also graphically represent losses in each indicator as a result of COVID-19. Thanks to all information we were able to properly analyse and calculate monthly and annual economic changes caused by Covid-19 using the method of comparing the data. This research reveals the annual changes for the European Union as a whole and its 27 members. The average annual unemployment rate in European Union in 2020 indicated 2% of growth. The trade sector was hit seriously, European Union's exports fell by 10% and imports fell by 18% in contrast with previous periods. The inflation rate in European Union in 2020 has an annual increase of 0.7%. The government debt of the European Union in the 3rd quarter was 5% higher than the 1st quarter of 2020. And the overall annual gross domestic product of the European Union and its 27 members has fallen by an average of 6%.

Keywords: Covid-19, Pandemics, Economics, European Union, Unemployment, GDP, Inflation, Import-Export, Government debt

Dopad covid-19 na hospodářství Evropské unie

Abstrakt

Globální pandemie koronaviru 2019 (Covid-19) nejenže způsobila nemoci a úmrtí, ale také způsobila zmatek v globální ekonomice v rozsahu, který jsme neviděli přinejmenším od Velké hospodářské krize. Epidemie má potenciál zničit jednotlivé živobytí, podniky, trhy a ekonomiky jako celek. Těžební sektor není vůči těmto dopadům odolný a krize má potenciál mít vážné krátkodobé, střednědobé a dlouhodobé důsledky pro hospodářská odvětví.

Před výzkumem dopadů pandemie je důležité znát historii a potenciální důsledky ohnisek a tato práce poskytuje obecné znalosti o pandemiích a jejich vlivu na lidstvo a ekonomiku. Práce navíc poskytuje pochopení těchto dopadů a zdůsymání jejich významu pro průmysl.

Hlavním cílem práce je zkoumat ekonomické dopady Covid-19 na hospodářství Evropské unie. Práce zkoumá, jak epidemie ovlivnila ekonomické sekce, jako je nezaměstnanost, inflace, dovoz-vývoz, HDP a vládní dluh, na základě spolehlivých údajů shromážděných z databáze Eurostatu a Comtrade OSN, a bude také graficky představovat ztráty v každém ukazateli v důsledku COVID-19. Díky všem informacím jsme byli schopni správně analyzovat a vypočítat měsíční a roční ekonomické změny způsobené Covid-19 metodou porovnávání údajů. Tento výzkum odhaluje každoroční změny pro Evropskou unii jako celek a jejích 27 členů. Průměrná roční míra nezaměstnanosti v Evropské unii v roce 2020 ukázala 2 % růstu. Obchodní sektor byl vážně zasažen, vývoz Evropské unie klesl o 10 % a dovoz klesl o 18 % na rozdíl od předchozích období. Míra inflace v Evropské unii v roce 2020 meziročně vzrostla o 0,7 %. Státní dluh Evropské unie byl ve 3. čtvrtletí o 5 % vyšší než v 1. čtvrtletí roku 2020. A celkový hrubý domácí produkt Evropské unie a jejích 27 členů klesl v průměru o 6 %.

Klíčová slova: Covid-19, Pandemie, Ekonomika, Evropská unie, Nezaměstnanost, HDP, Inflace, Import-Export, Státní dluh

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1 Introduction

The world was hit by a pandemic in the first half of 2020. It was known as a new coronavirus (severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2) and later referred to as Coronavirus Disease 19 or COVID-19. While COVID-19 emerged in Wuhan City, Hubei Province of China, it has spread rapidly throughout the world, resulting in human tragedy and enormous economic harm. By March 2021, over 117 million cases of COVID-19 had been recorded worldwide, with more than 2.6 million deaths.

Due to the rapid spread of COVID-19, countries around the world have taken a number of public health steps to prevent its spread, including social distancing. As part of the social distance, companies, schools, community centers, and non-governmental organizations (NGOs) were forced to shut down, mass meetings were banned, and locking steps were enforced in many countries, allowing travel only for urgent needs. The objective is that by social distancing, countries will be able to "flatten the curve," i.e. minimize the number of new cases linked to COVID-19 from one day to the next in order to stop rapid growth and thereby reduce pressure on medical services.

Measures taken by counties across the globe to help deter the spread of Covid-19 have had a dramatic impact on foreign trade in commodities, with a few notable exceptions. These include goods used in direct response to the COVID-19 pandemic: sterilization products (such as disinfectants), medical vehicles and furniture, protective clothing, diagnostic testing equipment, medical devices, oxygen therapy supplies and medical consumables, or so-called COVID-19 related products.

The present crisis is generated spillover effects throughout supply chains. Therefore, countries highly dependent on foreign trade are more negatively affected. Moreover, the spread of Covid-19 is expected to result in a considerable slowdown of economic activities, the longer the virus spreads, the more economic performance will be affected, raising concerns about financial sustainability, especially for highly indebted countries.

2 Objectives and Methodology

2.1 Objectives

The primary objective of the work is to research the impact of Covid-19 on the economy of the European Union. The originality of the work lies in analysing and determining the impact of the Covid-19 Pandemic on most major economic industries of the EU such as GDP, Inflation rate, Import-Export, Unemployment, and Government debt.
Research questions:

- Which countries were most affected by unemployment during Covid-19?
- Which countries had high inflation rate due to Covid-19?
- How much the trade sector was affected during the pandemic?
- How much Covid-19 has reduced GDP in the countries of the European Union?
- Which countries plunged into national debt the most during the pandemic?

2.2 Methodology

The research methodology used in this bachelor thesis is divided into two major parts. The theoretical part consists of a compilation of articles found in literature and research papers that provides a clear understanding and vision of past pandemics and their effects on humanity and the economy. The practical part of the thesis consists of a monthly and quarterly comparison of average data of 2018/19 to data of 2020 gathered from reliable sources such as Eurostat and UN Comtrade database. Research Methods used in work – Index calculation, percentage calculation, deduction, and comparison. Gained results are discussed with reliable literature.

The indicators include:

- Unemployment rate from Eurostat (Monthly data, 1/2018 – 12/ 2020) percentage of active population
- Import and Export from UN Comtrade database (Monthly data, 1/2018 – 12/2020) million USD
- Inflation rate from Eurostat (Monthly data, 01/2018 – 12/2020) average rate of change
- Government consolidated gross debt from Eurostat (Quarterly data, IQ/2018 – IIIQ 2020) percentage of gross domestic product.
- Gross domestic product at market prices from Eurostat (Quarterly data, I-Q/2018 – IVQ/2020) million euro

3 Literature Review

3.1 General overview of Pandemic

Understanding the disease and how it progresses naturally is the first step in understanding a pandemic. The term "disease" refers to a condition that has a detrimental impact on the body of a living human, plant, or animal. A pathogenic infection causes a disease to damage the body. The disease's normal course begins before the onset of infection, after that, it moves on to the pre-symptomatic stage. The clinical phase is the final step. The prognosis of the disease is given to a patient during the clinical process. The patient reaches the remission stage after successfully treating the disease. A reduction in symptoms or the complete absence of the disease is referred to as remission. During the remission stage, the patient must strictly obey the doctor's orders. This will prevent the disease from returning. If treatment fails, the patient can die or become permanently disabled. Diseases are divided into two categories: (i) Congenital diseases, (ii) Acquired diseases. (Shinde 2021)

Congenital disorders are present in the body from the moment of birth. Genetic conditions, environmental causes, or a combination of both are commonly responsible for the onset of these diseases. Hearing disorders and Down syndrome, for example, are inherited illnesses that are passed down through generations. In comparison to infectious diseases, acquired diseases are transmitted by living organisms. These aren't inherited traits. (Shinde 2021)

The group of acquired diseases is further divided into two types: (i) Infectious diseases; (ii) non-infectious diseases. Infectious diseases are caused by pathogens and viruses. They are also known as communicable diseases. As the name implies, these diseases are infectious. It means that if one person contracts an infectious disease, the disease can be spread to others through the air, food, water, touch (physical contact), and other means. Examples of infectious diseases are SARS and SARS COVID-19.

Non-infectious diseases, on the other hand, are not caused by any sort of infection, as the name implies. It means that a person with a noninfectious disease cannot transmit the disease to someone who is healthy. Non-infectious diseases include cancer and auto-immune disorders, for example. (Shinde 2021)

A healthy person may be affected by infectious disease in two ways: (i) Direct transmission, (ii) Transmission that is not direct. Direct transfer occurs when bacteria migrate directly from a patient to a healthy person without the use of a middle carrier. Direct transmission can take place in a variety of ways:

Getting in touch with an infected person.

The infection spreads by droplets (coughing, sneezing, and spitting).

Coming in contact with the soil.

Direct transmission can also be transmitted via animal bites.

When there is an infection reservoir that can transmit the disease from a patient to a healthy person with a middle-agent, that transmission is known as indirect transmission. Indirect transmission can take place in the following ways:
If pathogens are transmitted through food, water, etc., they are known as vehicle-borne diseases.
If viruses are transmitted through the air, they are known as airborne diseases.
If pathogens are transmitted through contaminated objects such as clothing, utensils, books, etc., they are known as fomite-borne diseases.

The most important part comes after the diagnosis of the disease: the treatment. Treatment generally consists of targeting biochemical reactions caused by pathogens. There are two ways to stop this reaction so that the infection does not spread: I prevention; (ii) cure.

In order to put patients at ease, the effects of the infection can be minimized by prevention and the use of painkillers. Immunization and vaccines are both preventive steps. Cure involves the use of specific medications to destroy the pathogen. (Shinde 2021)

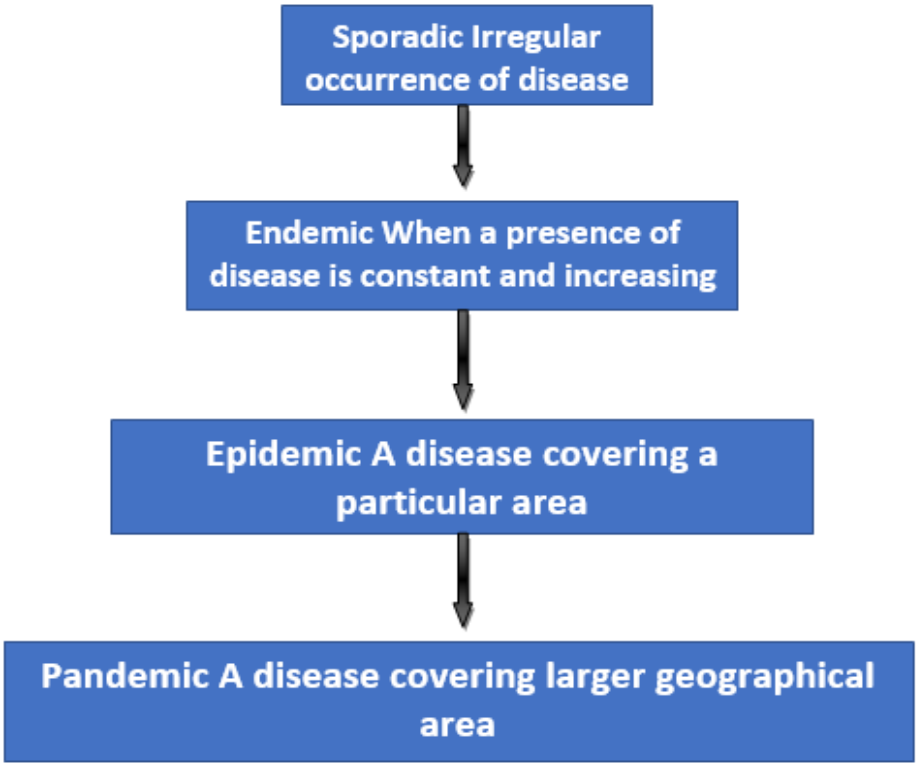
3.1.1 Definition and Stages

3.1.2 Stages of disease

It is important to research basic terminologies associated with disease transmission patterns before studying the last pandemic. Figure 1 depicts a diagrammatical outline of the disease's phases.

(i) **Sporadic** - When the occurrence of the disease is not regular and is rare, it is referred to as sporadic.
(ii) **Endemic** - If the presence of the disease is constant in a particular geographical area, it is referred as endemic. When a high degree of disease occurrence is detected, endemic becomes hyperendemic.
(iii) **Epidemic** - When there is a sudden increase in the number of patients with the same disease and in a specific area, it is referred to as an epidemic.

Figure 1. Stages of the disease



Source : Shukhrat Saidmurodov, Data from (Shinde 2021)

(iv) **Pandemic**

A pandemic (from Greek πᾶν pan "all" + δῆμος demos "people") is an epidemic of contagious disease that is spreading through human populations across a large region: for example a continent, or even worldwide. A common endemic illness that is stable in terms of how many people are becoming sick is not a pandemic. Further, flu pandemics exclude seasonal flu, unless the seasonal flu is a pandemic. (Lacroix 2014). The causes of pandemics depend on a number of factors - the index of the contagiousness of the disease, the antigenic variability of pathogens, the ways of their transmission (airborne droplets predominate), the intensity of immunity in the population, the density of its residence, and the intensity of international medicine. connections, etc. (Big Russian encyclopedia 2021)

When the following two conditions are met, a disease becomes an epidemic. The first is when a large number of people are affected by a disease or illness with a similar nature and root cause, and the second is when the number of infected people grows exponentially over time. A pandemic occurs when an epidemic spreads beyond territorial borders and affects a large geographic region at the same time. Because of its infectious nature, an epidemic is classified as a pandemic. A pandemic provides no details about the disease's magnitude or effects. It simply notes that people from all over the world are being infected with the disease. (Shinde 2021)

Another term that is widely used in the study of infectious diseases is "outbreak." The Outbreak occurs when there is a sudden increase in the number of patients. Outbreaks may last for a few days, weeks, or months. Sometimes a pandemic is also referred to as an outbreak. (Shinde 2021)

3.1.3 Pandemic Phases and Definition

When does the disease officially become a pandemic? The World Health Organization is in charge of determining whether an infectious disease becomes a pandemic, but the decision isn't always straightforward. The World Health Organization considers three factors when deciding whether to use the term pandemic: the virus's geographical distribution, the magnitude of the disease caused by the virus, and the disease's societal effects. The disease is more likely to become a pandemic if it is triggered by a new strain of the virus, such as coronavirus disease 2019 or COVID-19. The ease with which it infects people and spreads them from person to person also plays a role in the designation. (CNBC International 2020)

The World Health Organization (WHO) has delivered a six-stage arrangement that portrays the cycle by which a novel flu infection moves from the initial not many diseases in people through to a pandemic. These beginnings with the infection generally tainting creatures, with a couple of situations where creatures contaminate individuals, at that point travels through the stage where the infection starts to spread straightforwardly among individuals and finishes with a pandemic when diseases from the new infection have spread around the world. (Lacroix 2014)
When the WHO issues a pandemic warning for an epidemic, it goes through 6 different phases.
Phase 1: A pathogen/virus that exists in animals has not caused any kind of human infection.
Phase 2: Humans have been infected with a pathogen/virus.
Phase 3: Small groups of people or random individuals are infected with the virus.
Phase 4: Human to human transmission is observed as a result of a community-level outbreak.
Phase 5: The disease has spread to multiple WHO regions.
Phase 6: An outbreak of disease occurs in one or more regions other than those listed in Phase 5. (Shinde 2021)

A disease or illness that is common or kills a large number of people is not a pandemic; it must not be contagious. Cancer, for example, kills a lot of people but isn't considered a pandemic since it's not airborne or contagious.
In a virtual press conference in May 2009 on the influenza pandemic Dr. Keiji Fukuda, Assistant Director-General ad Interim for Health Security and Environment, WHO said *"An easy way to think about pandemic… is to say a pandemic is a global outbreak. Then you might ask yourself "What is a global outbreak"? Global outbreak means that we see both spread of the agent ... and then we see disease activities in addition to the spread of the virus."* (Lacroix 2014)
In the planning process for possible influenza The WHO Pandemic published a document on Pandemic Preparedness Guidelines in 1999, revised in 2005 and during the 2009 outbreak, defining phases and appropriate actions for each phase of the assistance memoir entitled WHO Pandemic Phase Descriptions and main actions by phase. This paper is about influenza in all variants. The phases are characterized by the disease's spread; virulence and mortality are not specified in the current WHO definition, despite their inclusion in previous versions. (Lacroix 2014)

3.1.4 Pandemic risk factors

Pandemic risks are primarily determined by a combination of spread and spark risk. The pathogen is transmitted from animals to humans, which causes the spark danger. Domestic or wild animals may be included. The disease is restricted to heavily populated areas attributable to domestic animals. Live animal markets, wildlife ponds, and other sources of spark threats are major contributors. The spread risk normally comes after the spark risk. As the name implies, it is concerned with the virus's dissemination as well as its genetic adaptation. The population density, trade patterns, and travel patterns of the population all influence the spread risk. (Shinde 2021)

3.1.5 Pandemics Mitigation

The most important thing you can do in the event of a pandemic is to be prepared and have response teams available. The following are the different types of preparations:
(i) Pre-pandemic period,
(ii) Spark period,
(iii) Spread period.

As the name implies, the pre-pandemic era is the time leading up to a pandemic. Continual preparation, simulation activities, public health training, situational awareness, and other topics are discussed in this point.

The identification of the pandemic's initial outbreak is known as the spark period. This stage covers pathogen confirmation in the lab, touch tracking, quarantine, situational awareness, and so on. (Shinde 2021)

The spread period is when the WHO declares the disease to be a global pandemic. Along with tracing and quarantine, vaccine or antiviral administration is taking place at this stage. Treatment and patient care is an important part of these three stages. While the vaccine is being developed, close coordination between the public and private sectors should take place. (Shinde 2021)

3.1.6 Situational awareness

Situational awareness entails getting up-to-date awareness of emerging infectious diseases as well as understanding how to handle the threat with the resources at hand. Situational awareness is a key activity in both the spark period and the spread period. It is important to have the help of healthcare providers, the media, and diagnostic labs. It's critical at this point to comprehend pathogen progression and gather all required resources to halt the spread of disease. The number of patients affected by the disease may skyrocket in a short amount of time. This unexpected clinical uptick needs to be handled appropriately. (Shinde 2021)

3.2 Historical Aspect

There have been a number of significant pandemics recorded in human history, generally zoonoses which came about with the domestication of animals, such as influenza and tuberculosis. (Lacroix 2014) Some Pandemics, which had the most destructive consequences for people, received special names: for example, the "Justinian plague" (6th century, during the reign of Emperor Justinian I), P. plague in the 14th century. - "black death", P. influenza in the 20th century. - "Spanish".(Big Russian encyclopedia 2021)

The Plague of Athens occurred in 430 BC. Over the course of four years, typhoid fever killed a quarter of the Athenian troops and a quarter of the city. This disease fatally undermined Athens dominance, but the disease's sheer virulence stopped it from spreading further; that is, it killed off its hosts faster than they could spread it. The exact cause of the plague has been unknown for many years. In January 2006, researchers at the University of Athens analysed teeth recovered from a mass grave below the city and confirmed the presence of typhoid-responsible bacteria.
Antonine Plague, 165-180. Possibly smallpox brought to the Italian peninsula by soldiers returning from the Near East, killing a quarter of those infected, and a total of up to five million. At the height of the second outbreak, the Cyprian Plague (251–266), which could have been the same disease, 5,000 people were said to die every day in Rome. (Lacroix 2014)
Plague of Justinian, from 541 to 750, was the first bubonic plague outbreak ever recorded. It began in Egypt, and reached Constantinople the following spring, killing (according to the Byzantine chronicler Procopius) 10,000 a day at its height, and perhaps 40% of the inhabitants of the city. The plague was followed by the elimination of a quarter to half of the human population that had struck the entire known world. It caused Europe's population to fall by around 50% between 550 and 700. (Lacroix 2014)

Black Death, begun the fourteenth century. The complete number of deaths around the globe is assessed at 75 million individuals. 800 years after the last episode, the plague got back to Europe. Beginning in Asia, the sickness arrived at the Mediterranean and western Europe in 1348 (conceivably from Italian shippers escaping battling in the Crimea), and slaughtered an expected 20 to 30 million Europeans in six years; 33% of the complete populace, and up to a half in the most noticeably awful influenced metropolitan regions. It was the first of a pattern of European plague pandemics that proceeded until the eighteenth century. During this period, in excess of 100 plague pestilences cleared across Europe. In England, for instance, pandemics would proceed in two to five-year cycles from 1361 to 1480. By the 1370s, England's populace was diminished by half. The Great Plague of London of 1665–66 was the last significant flare-up of the plague in England. The illness slaughtered roughly 100,000 individuals, 20% of London's populace. (Lacroix 2014)
The Third Pandemic, which began in China in the middle of the 19th century, spread the plague to all the inhabited continents and killed 10 million people in India alone. During this pandemic, the United States saw its first case of plague in San Francisco in 1900. There are still isolated cases of plague in the western United States today.

Meetings between European explorers and populations in the rest of the world have often led to local epidemics of extraordinary virulence. Sickness murdered the whole local (Guanches) populace of the Canary Islands in the sixteenth century. A large portion of the

local populace of Hispaniola in 1518 was executed by smallpox. Smallpox additionally attacked Mexico during the 1520s, murdering 150,000 in Tenochtitlán alone, including the sovereign, and Peru during the 1530s, supporting the European champions. Measles slaughtered a further 2,000,000 Mexican locals in the seventeenth century. In 1618–1619, smallpox cleared out 90% of the Massachusetts Bay Native Americans. During the 1770s, smallpox executed at any rate 30% of the Pacific Northwest Native Americans. Smallpox pestilences in 1780–1782 and 1837–1838 brought decimation and exceptional elimination among the Plains Indians. Some accept that the demise of up to 95% of the Native American populace of the New World was brought about by Old World infections like smallpox, measles, and flu. Throughout the long term, the Europeans had grown high levels of invulnerability to these infections, while the native people groups had no such resistance. (Lacroix 2014)

Cholera

First cholera pandemic 1816-1826. Recently confined to the Indian subcontinent, the pandemic started in Bengal, at that point spread across India by 1820. 10,000 British soldiers and innumerable Indians passed on during this pandemic. It reached out similar to China, Indonesia (where in excess of 100,000 individuals capitulated on the island of Java alone) and the Caspian Sea prior to subsiding. Passings in India somewhere in the range of 1817 and 1860 are assessed to have surpassed 15 million people. Another 23 million kicked the bucket somewhere in the range of 1865 and 1917. Russian deaths during a comparative period surpassed 2 million. (Lacroix 2014)

Second cholera pandemic 1829–1851. Arrived at Russia, Hungary (around 100,000 deaths) and Germany in 1831, London in 1832 (in excess of 55,000 people kicked the bucket in the United Kingdom), France, Canada (Ontario), and United States (New York) in the very year, and the Pacific shore of North America by 1834. A two-year flare-up started in England and Wales in 1848 and guaranteed 52,000 lives. It is accepted that more than 150,000 Americans died of cholera somewhere in the range of 1832 and 1849.

Third pandemic of 1852–1860. Russia was mainly affected, with over a million deaths. Cholera spread east to Indonesia in 1852 and then invaded China and Japan in 1854. The Philippines was infected in 1858 and Korea in 1859. In 1859, the pandemic in Bengal again led to the spread of the disease to Iran, Iraq, Arabia and Russia. (Lacroix 2014)

Fourth pandemic of 1863–1875. Spread mainly in Europe and Africa. At least 30,000 of the 90,000 Mecca pilgrims were the victims of the disease. In 1866, Cholera claimed 90,000 lives in Russia.

In 1866, there was an outbreak in North America. It killed some 50,000 Americans.(Lacroix 2014)

The fifth pandemic occurred between 1881 and 1896. The 1883-1887 epidemic claimed the lives of 250,000 people in Europe and at least 50,000 people in the Americas. Cholera took the lives of 267,890 people in Russia (1892), 120,000 people in Spain, 90,000 people in Japan, and 60,000 people in Persia.

Cholera poisoned Hamburg's water supply in 1892, killing 8606 people.

The sixth pandemic lasted from 1899 to 1923. Because of developments in public health in Europe, it had little effect, but Russia was once again severely impacted (more than 500,000 people dying of cholera during the first quarter of the 20th century). The sixth

pandemic caused more than 800,000 deaths in India. The 1902-1904 cholera epidemic claimed more than 200,000 lives in the Philippines. The 27th epidemic was recorded during the 19th century to 1930 pilgrimages to Mecca, and more than 20,000 pilgrims died of cholera during the Hajj period 1907–08.

The seventh pandemic, which lasted from 1962 to 1966, was the seventh in the series of pandemics It all started in Indonesia, where it was dubbed El Tor after the strain, and spread to Bangladesh in 1963, India in 1964, and the Soviet Union in 1966. (Lacroix 2014)

Smallpox

Smallpox is an exceptionally infectious illness brought about by the Variola virus. The sickness slaughtered an expected 400,000 Europeans each year during the end long periods of the eighteenth century. During the twentieth century, it is assessed that smallpox was answerable for 300–500 million passings. As of late as the mid-1950s an expected 50 million instances of smallpox happened on the planet every year. After effective inoculation crusades all through the nineteenth and twentieth hundreds of years, the WHO confirmed the destruction of smallpox in December 1979. Right up till the present time, smallpox is the lone human irresistible illness to have been totally destroyed. (Lacroix 2014)

Tuberculosis

33% of the world's present populace has been tainted with Mycobacterium tuberculosis, and new diseases happen at a pace of one every second. Around 5-10% of these idle contaminations will at last advance to dynamic infection, which, whenever left untreated, executes the greater part of its casualties. Every year, 8 million individuals become sick with tuberculosis, and 2 million individuals pass on from the sickness around the world. In the nineteenth century, tuberculosis slaughtered an expected one-fourth of the grown-up populace of Europe; and by 1918 one out of six deaths in France were as yet brought about by TB. By the late nineteenth century, 70 to 90% of the metropolitan populaces of Europe and North America were contaminated with M. tuberculosis, and about 40% of average deaths in urban areas were from tuberculosis. During the twentieth century, tuberculosis executed around 100 million individuals. TB is as yet quite possibly the main medical issues in the creating scene. (Lacroix 2014)

SARS

In 2003, there were worries that Severe Acute Respiratory Syndrome (SARS), another and profoundly infectious type of abnormal pneumonia, may get pandemic. It is brought about by a Covid named SARS-CoV. Fast activity by public and worldwide wellbeing specialists, for example, the World Health Organization assisted with easing back transmission and ultimately broke the chain of transmission. That finished the limited plagues before they could turn into a pandemic. Be that as it may, the infection has not been annihilated. It could reappear. This warrants checking and announcing of dubious instances of abnormal pneumonia. (Lacroix 2014)

Table 1, Historical Timeline of Pandemics

NAME	Time Period	Type/Pre-human host	Estimated Death Toll
Antonine Plague	165-180	Believed to be either smallpox or measles	5 million
Japanese smallpox epidemic	735-737	Variola major virus	1 million
Plague of Justinian	541-542	Yersinia pestis bacteria/rats, fleas	30 to 50 million
Black Death	1347-1351	Yersinia pestis bacteria/rats, fleas	200 million
New World Smallpox Outbreak	1520-onwards	Variola major virus	56 million
Great Plague of London	1665	Yersinia pestis bacteria/rats, fleas	100,000
Italian Plague	1629-1631	Yersinia pestis bacteria/rats, fleas	1 million
Cholera Pandemics 1-6	1817-1923	V. cholerae bacteria	1 million+
Third Plague	1885	Yersinia pestis bacteria/rats, fleas	12 million (China & India)
Yellow Fever	Late 1800s	Virus/Mosquitoes	100,000-150,000 (US)
Russian Flu	1889-1890	H2N2 (avian origin)	1 million
Spanish Flu	1918-1919	H1N1 virus/pigs	40 to 50 million
Asian Flu	1957-1958	H2N2 virus	1.1 million
Hong Kong Flu	1968-1970	H3N2 virus	1 million
HIV/AIDS	1981-present	Virus/chimpanzees	25 to 35 million
Swine Flu	2009-2010	H1N1 virus/pigs	200,000
SARS	2002-2003	Coronavirus/bats, civets	770
Ebola	2014-2016	Ebolavirus/ wild animals	11,000
MERS	2015-present	Coronavirus/bats, camels	850

Source: (Brodeur et al. 2020)

3.3 Current Pandemics

2009 influenza A/H1N1

The outbreak started in the state of Veracruz, Mexico, with evidence that the epidemic had been continuous for months before it was legally acknowledged as such. The Mexican government closed most of Mexico City's public and private facilities in effort to contain the transmission of the virus; however, it continued to spread globally, and clinics in some areas were overwhelmed by infected people. In June, the World Health Organization (WHO) and the United States Centers for Disease Control (CDC) stopped counting cases and stated the outbreak a pandemic. Although informally referred to as "swine flu", the H1N1 flu virus cannot be spread by eating pork or pork products; similar to other influenza viruses, it is usually contracted by person-to-person transmission through respiratory droplets. Symptoms usually last for 4–6 days. Antivirals (oseltamivir or zanamivir) have been recommended for those with more obvious symptoms or those in an at-risk group. There are presently 14,286 confirmed deaths worldwide. This figure is the total amount of confirmed deaths reported by the public bodies; the WHO states that total mortality (including unidentified or unreported deaths) from the new H1N1 strain is "unquestionably higher". (Lacroix 2014)

The pandemic started to tighten in November 2009, and by May 2010, the number of cases was in steep decrease. On 10 August 2010, the Director-General of the World Health Organization, Margaret Chan, announced the finish of the H1N1 pandemic. Chan noticed that the H1N1 pandemic might have been a lot more awful. As per the most recent WHO measurements, the infection has executed in excess of 18,000 individuals since it showed up in April 2009, around 4% of the 250,000 to 500,000 yearly flu passings. Research released in September 2010 revealed that children with pandemic influenza are much less likely to develop complications than those with seasonal flu strains, which contradicted early reports on the intensity of the pandemic. The WHO, critics argued, inflated the danger, spreading "fear and uncertainty" rather than "immediate facts." The WHO launched an investigation to see if it had "unnecessarily scared people." (Lacroix 2014)

HIV and AIDS

The human immunodeficiency virus (HIV) causes the acquired immune deficiency syndrome (AIDS) pandemic (HIV). Since its discovery in 1981, AIDS has claimed the lives of over 25 million people, making it one of the most deadly diseases in human history. Despite recent improved access to antiretroviral treatment and care in many regions of the world, an estimated 2.1 million people were killed by the AIDS pandemic in 2007, including 330,000 children. In 2007, an estimated 33.2 million people globally lived with the disease, with an estimated 2.5 million people being infected for the first time in 2007. This has been due to a lack of antiretroviral drug coverage in large areas, such as Africa, where, according to French researcher Olivier Schwarz, only around 10% of infected people have access to it.
The origin of HIV/AIDS has been elucidated by HIV genome studies which show that the most common type of HIV (HIV-1) originated in chimpanzees.

In regions, the pandemic is not homogeneous, with some states more affected than the others. There are wide variations in the level of infection between different areas, even at the country level. Despite the implementation of prevention strategies, the number of people infected with HIV continues to rise in most parts of the world, with Sub-Saharan

Africa being by far the worst affected region, with an estimated 22.5 million at the end of 2007, accounting for 68 percent of the global total. South & South East Asia is estimated to account for 12 percent of the global total.

With regard to the social effects of the HIV/AIDS pandemic, some sociologists suggest that AIDS has caused a "profound medialization of sexuality." Social factors also have an impact on HIV/AIDS. The 2003 study shows that HIV and AIDS are less prevalent in Muslim populations and speculates that this may be due to the effects of a number of Islamic principles, such as the prevention of extramarital problems and the benefit of circumcision. (Lacroix 2014)

3.4 Socio-economic impacts of Pandemics

Health is fundamental to a prosperous, productive society, while fear and sickness can stifle production, consumption, recreation, travel and overall well-being. While non-health sectors are often taken into account in the context of negative externalities in driving disease events, The possible effects they face from disease events justify their commitment to finding multi-sectoral solutions to reduce and manage disease risks. On a broad scale, the far-reaching impacts of pandemics are parallel to other disasters. (Smith et al. 2019a)

First of all, and perhaps most obviously, there are expenses to the public and private health care system for the treatment of the infected individual and for the control of the outbreak. A large outbreak can overwhelm the healthcare system, limit the ability to deal with routine health issues and compound the problem. Aside from the health-care industry, epidemics cause both the sick and their caregivers to miss work or be less productive at their jobs, lowering and disrupting productivity. Fear of infection may lead to social isolation or the closure of schools, businesses, retail outlets, transportation, and government services, both of which disrupt economic and other socially beneficial behavior. (David E. Bloom, Daniel Cadarette, and JP Sevilla 2018)

Some major impacts of pandemics, divided into categories:

Healthcare

- Challenges for the diagnosis, quarantine, and treatment of suspected or confirmed cases
- High burden on the operating of the current medical system
- Patients with other illnesses and health problems are being neglected
- Overload on doctors and other healthcare professionals at a quite high risk
- Overloading of medical stores
- The requirement for high protection
- Medical supply chain disruption

Economic

- Slowing down of the manufacturing of essential goods
- Disrupt the supply chain of goods
- Losses in domestic and international business
- Poor market cash flow
- Significant slowdown in revenue growth

Social

- The service sector is not in a position to provide its proper service
- Cancellation or postponement of major sports and tournaments
- Avoiding regional and global travel and cancelation of services

- Disruption of cultural, religious, and festive celebrations
- Unfair stress among the population
- Social distance between our peers and family members
- Closing of hotels, restaurants, and religious sites
- Closing of entertainment venues such as movie and play theaters, sports clubs, gymnasiums, swimming pools, and so on.
-Postponement of examinations. (Haleem, Javaid, a Vaishya 2020)

3.4.1 Examples of multi-sectoral impacts of infectious disease outbreaks

The Ebola outbreak in West Africa revealed the devastating economic consequences of an emerging infectious disease. Due to Ebola and lower commodity prices, Liberia's Gross Domestic Product (GDP) growth fell from 8.7% to 0.7 percent between 2013 and 2014, while Sierra Leone's GDP growth (excluding iron ore) fell from 5.3 percent to 0.8 percent. Guinea's GDP growth is expected to be 4% in 2015, fell to 0.1%. Government revenues in all three countries fell across the board, including direct taxes on businesses, VAT receipts, and indirect taxes; additionally, a loss of confidence among private and foreign investors resulted in funding gaps totaling more than the US $600 million over the two years. These impacts cut across a wide range of sectors and undoubtedly have long-term consequences, including effects on insurers and reinsurers (e.g. health, life) as well as overall business continuity due to lack of worker capacity during disease, and marketplaces are emerging to insure against pandemic risks (e.g. the Pandemic Emergency Financing Facility of the World Bank, a parametric insurance vehicle designed to provide rapid disbursement of emergency financing). Yet the involvement of the private sector, as well as public institutions outside the health sector, remains limited in the overall epidemic and pandemic planning and response. (Smith et al. 2019a)

3.4.2 Health Sector

Healthcare industry impacts of infectious disease outbreaks are often the most straightforward to estimate or at least count retroactively. However, for novel or recurring pathogens with unexpected clinical outcomes, predictions may be difficult, and cost estimates are often limited to short-term medical expenditure, health burden, or mortality. Typical Zika infections, for example, are unlikely to cause serious harm, but disease manifestation in infants may have far-reaching consequences. Not only are direct medical costs expected to rise during pregnancy, but post-natal direct and indirect costs are also expected to rise significantly, particularly given the implied long-term comprehensive care needed for these children as they develop. Alfaro-Murillo et al. estimated approximately the lifetime direct medical cost of complications to microcephaly at US $179,760 and the cost per case of Gillian-Barre Syndrome, a rare outcome of Zika cases (roughly 1%), at US$56,863. The Ulansky estimated that severe cases of GBS could cost up to US$500,000 per year and that the lifetime health costs of microcephalic-affected children might amount to US$10 million each. These forecasts would vary from country to country and do not include indirect costs such as specialized child support, loss of parental productivity, psychological costs for families with children with microcephalus, or the loss of productivity of the child once an adult and the support services required for that individual throughout his or her lifetime. The Zika epidemic has so far been estimated to cost US$7-18 billion to Latin America and the Caribbean between 2015 and 2017 alone. (Smith et al. 2019b)

The Ebola crisis in West Africa between 2013 and 2015 resulted in at least 28,616 reported cases and 11,310 confirmed deaths. In comparison, all other documented Ebola outbreaks combined resulted in 2427 cases and 1597 deaths. The crises range and depth is exacerbated by the countries' inadequate health-care systems. The breadth and depth of the crisis has been aggravated by poor healthcare systems in the nations it has affected. The outbreak resulted in 881 infections in healthcare workers themselves (513 deaths). The overall health workforce has decreased by 8%in Liberia and 23% in Sierra Leone; this loss in healthcare services has resulted in an estimated 10,600 additional deaths due to non - treated conditions in Guinea, Liberia, and Sierra Leone (1091 deaths due to HIV, 2714 deaths due to tuberculosis; and 6818 deaths due to malaria). In addition, prenatal consultations declined, out-of-hospital childbirths increased (in-hospital and health clinic births decreased by 30% in Sierra Leone), child immunization coverage decreased by 30% during the epidemic, and childhood fatalities increased due to measles and other vaccine-preventable diseases. (Smith et al. 2019a)

3.4.3 Agricultural sector/food animal production systems

Given that 60% of all human infectious pathogens occur from animals, the agricultural sectors associated with zoonotic outbreaks frequently suffer significant undervalued economic impacts. Fifty percent of livestock losses reported to the World Organization for Animal Health (OIE), The international standard-setting organization for animal disease due to zoonotic diseases and zoonoses has a much higher percentage of killing animals (43% of livestock losses) as part of disease control disposal compared to non-zoonotic events (6 percent of livestock losses). However, the incentive for the agricultural sector (i.e. food production of livestock) to invest in the prevention of infectious diseases is often correlated with the economic relevance of the industry to its overall national GDP. Investment in animal health infrastructure is prioritized in the United States, where net meat exports account for nearly 12% of production. However, many developing nations engaged in agricultural trade have competing priorities that lead to lower investment in and protection of animal health infrastructure and may therefore not be able to take appropriate biosecurity measures. After Saudi Arabia and Yemen had experienced the introduction of the Rift Valley Fever virus in 2000, Arab countries prohibited imports of live animals from at least nine African countries, leading to a complete collapse of the Somali livestock market. Ninety percent of Somalia's total income came from livestock exports and the ban resulted in a loss of more than 75% of exports and US$300 million. This triggered social and financial destabilization, loss of livelihoods and food security, and ultimately the Somali government's instability, with GDP declining by 25–36%. (Smith et al. 2019a)

In the agriculture sector, the costs of infectious disease outbreaks are often calculated solely in terms of the value of livestock killed, while the long-term consequences are often overlooked. During the 1998 pandemic of the Nipah virus in Malaysia (resulting in 283 human cases of viral encephalitis and 109 deaths), the Malaysian state pays US$97 million in compensation for the 1.1 million pigs killed as a result of the outbreak. These effects, however, have contributed to an additional US$229 million in indirect costs of lost government tax revenue and declines in foreign trade, and US$136 million in costs for the Biosafety and slaughter facility control program. Pork consumption and exports remained modified over the long term (dropping by 80 percent during the outbreak and remaining 30 percent depressed post-outbreak;). The uncontrolled economic impact of this outbreak in Malaysia continues to this day. The pig-farming industry collapsed in hard-hit areas,

forcing many pig-farmers to try to move to other jobs for which they had no training or education. Long-term unemployment or underemployment followed for these families and they were unable to reach their previous economic status, also impacting many local businesses that thrived on them.

In the case of the H1N1 pandemic of influenza in Mexico, the mere public perception of the risk has resulted in costly consequences for the state's pig industry; exports of chilled and fresh pork have seen a significant decline (e.g., a reduction of >60% to Japan) resulting in the country's pork trade deficit of US$27 million by the end of 2009. (Smith et al. 2019a)

3.4.4 Tourism and travel

Travel and tourism are two terms that are used interchangeably. Tourist arrivals in Hong Kong fell by 68 percent just two months after the WHO issued an alert about the epidemic in 2003, resulting in a $6 billion revenue loss for Asia-Pacific carriers and a $1 billion revenue loss for North American airlines. Tourism in Singapore has dropped by more than 70%, prompting Singapore Airlines to put 6600 flight crew members on unpaid leave. At a local level, the effects were also felt strongly. For example, attendance at China's Guangzhou trade fair increased by 12% from the previous year. (Smith et al. 2019a)

In South Korea, where MERS was introduced in 2015 and triggered a brief outbreak, foreign visitors fell by 41% in mid-summer compared to the same month the previous year. Just one month later, the number of tourists had dropped by 60%. The Korean government suffered a $10 billion loss and was forced to launch expensive tourism programs in the years following to entice tourists to visit. Similarly, MERS-related travel restrictions cost Saudi Arabia's tourism sector an estimated $5 billion per year.

The H1N1 influenza caused a $2.8 billion hit to Mexico's tourism industry, the country's largest service sector, with one million visitors fleeing the country over a five-month span due to fear of contagion. Similar patterns have been observed in self-restricted travel by consumers concerned about Zika virus exposure. Concerns and travel advisories issued in impacted areas of the world offer a snapshot of the situation. Even limited travel advisories in Miami, Florida, a high-tourism region, sparked political and economic backlash, with businesses reportedly experiencing 50–60 percent loss of revenue. If the virus spreads to countries where tourism is a major source of revenue, such as the Caribbean, the disease's economic effect on the travel industry will almost certainly increase dramatically. (Smith et al. 2019a)

3.4.5 Trade and retail industries

The gross global economic loss due to SARS was projected to be near US $40 billion after killing at least 800 people and infecting over 8000. In 2003, the Chinese bureau of statistics announced a 0.8 percent drop in GDP, owing primarily to losses in the tourism, transport, hotel, restaurant, and retail sectors. Because of the virus's ease of transmission in public places, much of the effect was attributable to consumer concerns. Hong Kong's GDP fell by 2.6 percent. International transportation companies like FedEx and airport shops like Estée Lauder were affected, causing economic ripples around the world.

Transportation restrictions and cancellations harmed multinational industries like oil, which saw demand in Asia fall by 300,000 barrels per day.
The total economic cost of the Nipah outbreak in Malaysia in 1998 was reported to be $582 million dollars. Losses impacted industries that were not directly linked to the pork industry (for example, the feed industry, which provided nutrition to pigs, saw a $15 million reduction in production;). Approximately 618 homes, 111 stores, schools, and banks were evacuated, and an estimated 36,000 people lost their jobs, not only in the pork industry, but in a variety of industries like utility and real estate (which lost US $1.1 million). (Smith et al. 2019a)

During the South Korean MERS epidemic, public contagion fears and government overreaction canceled a number of public events and stifled everyday activities. Housing and food sectors experienced a 10% drop in production from the previous year; entertainment and recreation production also decreased by 8.6%, and publishing, communications and information sectors decreased by 6.3%. Transportation and storage decreased by 2.4%, wholesale and retail by 1.6%, and electricity and air conditioning by 0.9%. However, the market reaction indicated a change in behavior due to the prevention of public settings: South Korea's largest market chain, E-Mart Co Ltd., reported an increase in online sales of 63 percent and the second-biggest chain, Homeplus, internet purchases rose by 50% at the beginning of June, as consumers avoided brick-and-mortar stores. Meanwhile, industries with a high proportion of temporary jobs (e.g. restaurants, housing and recreation) that are also typically disproportionately affected by outbreaks have had a significant impact, resulting in job losses. South Korean exports have also been affected, with the economy growing at only 0.3% in the second quarter of 2015; a record six-year low. (Smith et al. 2019b)

3.4.6 Environmental Impacts

As environmental services and resources are generally considered to be non-market goods (i.e., they are not traded on markets or their trading price does not represent their actual worth), damage to valuable natural resources, loss of wildlife populations, and environmental contamination are most often overlooked in economic assessments of disease events. During social and stability crises, local demand for natural resources can increase, leading to increased wildlife harvesting and illicit use of protected lands; enforcement of environmental protection policies may suffer as the government is overburdened with other responsibilities. For example, the quarantine and travel restrictions and enforcement measures during the outbreak of Ebola in West Africa have led to illegal poaching, logging, and mining and “negatively impacted advances in the safety of water catchment areas, forests and wildlife reserves, thus reversing previous efforts to achieve the Millennium Development Goals related to environmental protection”. During the H5N1 epidemics of influenza, national authorities killed wild birds, closed protected wetlands, and destroyed waterbird habitats in false attempts to stop the spread of the virus. (Smith et al. 2019a)
Economic tolls on environmental consequences are rarely measured due to poor valuation of ecological systems and other natural resources; however, focus on environmental value, at least for specific ecosystem services (e.g. pollination) has progressed over the last two decades through initiatives such as Ecosystem Economics and Biodiversity. Nonetheless, their integration with health-care decision-making is still severely limited. (Smith et al. 2019b)

3.4.7 Other Impacts

While morbidity and mortality values can indicate the magnitude of the disease's effect on the population, they do not make it possible for an individual, their household, or their community to appreciate the full impact of impaired disease productivity. For example, psychological, educational, or professional losses may have an effect on the individual customer and household. Not only did the extraordinarily high mortality rate during the outbreak of Ebola in West Africa resulted in increased social and household economic impacts, but also stifled growth rates, lost production and wages due to inability to work or contagious fears, increased poverty and food insecurity, job losses and lost education. The degree and type of economic impacts of households are also identified (although not exclusively). For Ebola, the 15–44 age group, employees, and parents of young children accounted for 57% of all infections, explaining why the effect on economic activity, hunger, and food safety was so substantial. Sixty to 70% of households recorded a substantial decline in income during the outbreak; reduction in household consumption and the prevalence of undernutrition increased. In addition, nearly 16,000 children lost their parents to Ebola, leaving them orphans in need of long-term treatment through family or other means. The closing of schools, which resulted in more than 33 weeks of missed schooling, was further believed to have exposed children to a number of forms of child abuse (including sexual harassment and violence against young girls) with long-term effects such as emotional distress, permanent withdrawal from the education system, and unwanted pregnancies. Military personnel has been drawn from standard public security duties to enforce quarantine facilities, a role for which they have not been educated. These are just partial examples of individual and household ripple effects that can have an impact on both the public and private sectors in a multitude of short-and long-term ways. (Smith et al. 2019a)

The outcomes of diseases and epidemics are not spread uniformly throughout the economy. Some industries may even prosper financially, while others may suffer excessively. Pharmaceutical companies producing vaccinations, antibiotics or other goods required to respond to an outbreak are possible beneficiaries. Health and life insurance providers are likely to incur high costs, at least in the short term, as are livestock farmers in the event of an epidemic involving animals. Vulnerable communities, especially the poor, are likely to suffer disproportionately, since they may have less access to health insurance and less savings to protect themselves from financial disasters. (David E. Bloom, Daniel Cadarette, and JP Sevilla 2018)

4 Practical Part

4.1 Evolution of Covid-19

Several cases of pneumonia with unknown etiology were recorded in Wuhan, China, in December 2019. Since the pathogen causing it was not clear back then, and considering that the key symptom was pneumonia, the disease was named "viral pneumonia of unknown origin." Later, it was reported that the disease was caused by a novel coronavirus, which changed its name to "novel coronavirus pneumonia." However, with further knowledge of this disease, it has been found that the virus may not only cause pneumonia. Infected people may have no evidence of pneumonia at all, although symptoms involving several other organs can occur. In the meantime, the word "novel" is not appropriate for naming a disease from a historical viewpoint. The World Health Organization (WHO) has now changed its name to "Coronavirus Disease 2019 (COVID-19)" After a lot of debate. (Zhang 2020)

Coronavirus Disease 2019 (COVID-19) is defined as a disease caused by a novel coronavirus, now known as severe acute respiratory syndrome coronavirus 2. (SARS-CoV-2; formerly called 2019-nCoV). (CDC 2020)

The root infection of the original cases was linked to the wholesale market of seafood. Since there is a similarity between SARS-CoV-2 and Bat-CoV RaTG13 (a gene detected by a bat), the researchers assumed that the bat was the initial host. Following studies, pig or pangolin were suggested as a possible intermediate host. The COVID-19 animal repository is possibly a snake. It appears that the infection was first transmitted by zoonotic agents (from animal to human). Despite the closure of the seafood market, the numbers of infected patients increased, indicating human-to-human transmission. Respiratory droplets (related to human respiratory actions such as talking, coughing, and sneezing) and direct contact are the most likely transmission pathways, but some cases indicate other transmission pathways such as: fecal-oral transmission, fomitic transmission (transfer of the virus through the object), perinatal (intrauterine) transmission. There have been few forms of research, some of which have been negative. All routes are under scrutiny and some researchers claim small samples have an effect on negative outcomes. (Naserghandi, Allameh, a Saffarpour 2020)

Symptoms of COVID-19 range from a person with no symptoms (asymptomatic) to a person with a serious case of pneumonia. The identified signs and symptoms of COVID-19 are as follows: fever, dry cough, fatigue, sputum development, breathlessness, itchy throat, headache, myalgia or arthralgia, chills, vomiting, nasal blockage, loose motion, hemoptysis, and conjunctival congestion. As the number of symptoms and signs is overwhelming, the measured percentage associated with each sign is different. (Shinde 2021)

Table 2 below provides a timeline of key events, starting from January 2020

Table 2, Timeline of COVID-19

Date	Events
4 January 2020	WHO reports cluster of pneumonia cases in Wuhan, Hubei, China
7 January 2020	WHO identifies COVID-19

11 January 2020	China announces 1st death from COVID-19
13 January 2020	1st official case of COVID-19 reported outside China in Thailand
17 January 2020	Authorities in the Nepal, France, Australia, Malaysia, Singapore, South Korea, Vietnam and Taiwan confirm cases
21 January 2020	1st case of COVID-19 reported in the United States of America (US)
22 January 2020	WHO finds evidence of human-to-human transmission from China
23 January 2020	China imposes lockdown in the cities of Wuhan, Xiantao and Chibi of the Hubei province
30 January 2020	WHO declares COVID-19 to be a Public Health Emergency of International Concern
31 January 2020	US declares COVID-19 a domestic public health emergency
2 February 2020	1st death due to COVID-19 outside of China in Philippines
9 February 2020	The death toll in China surpasses that of 2002-03 Severe Acute Respiratory Syndrome (SARS)
14 February 2020	Egypt reports 1st case of COVID-19, the 1st case in the African continent
15 February 2020	France reports 1 st death from COVID-19 outside of Asia
23 February 2020	COVID-19 cases rise in Italy in what becomes the largest outbreak outside of Asia
26 February 2020	Brazil confirms 1st case of COVID-19, the 1st case in South America
29 February 2020	1st death due to COVID-19 in the US
1 March 2020	The first case was reported in Czech Republic
4 March 2020	Germany banned the export of personal protective equipment, Many Schengen Area countries closed their borders to stem the spread of the virus.
8 March 2020	Over 100 countries report COVID-19 cases (Italy imposes quarantine in Lombardy region)
11 March 2020	WHO declares COVID-19 a pandemic
13 March 2020	Donald Trump declares national emergency in the US
19 March 2020	Italy's death toll surpasses that of China
21 March 2020	EU suspends public deficit rules to inject fiscal stimulus across countries
25 March 2020	The White House and Senate leaders of both the Democratic and Republican parties in the US come to an agreement on a US$2 trillion stimulus to aid workers, businesses, and the health-care system in response to the pandemic
28 March 2020	More than 250 million people were in lockdown in Europe
2 April 2020	Global cases of COVID-19 reach 1 million
8 April 2020	China lifts lockdown in Wuhan, 76 days after it was sealed off to contain COVID-19
11 April 2020	US records 2,000 deaths in one day, the highest single-day death toll recorded by any country
15 April 2020	Global cases of COVID-19 reach 2 million
27 April 2020	Global cases of COVID-19 reach 3 million
21 May 2020	Global cases of COVID-19 surpass 5 million
22 May 2020	Brazil surpasses Russia as the country with the 2nd highest number of cases, after the US
24 May 2020	68 days since its first recorded case, Montenegro became the first COVID-19-free country in Europe

18 June 2020	1 182 368 cases and 130 214 deaths have been reported in the EU
19 June 2020	Brazil reaches 1 million cases worldwide
24 June 2020	China approved the CanSino vaccine for limited use in the military and two inactivated virus vaccines for emergency use in high-risk occupations
28 June 2020	Data from Johns Hopkins University shows that the global numbers of cases and deaths have passed 10 million and 500,000 respectively
10 July 2020	The WHO reported a record increase in global coronavirus cases, with the total rising by 228,102 in 24 hour
10 July 2020	The Czech Republic reported 82 new cases, taking the total over 13,000.
16 July 2020	The United States passed 3.5 million total cases, with more than 137,000 deaths
11 August 2020	The number of global coronavirus cases has exceeded 20 million, over 12 million have recovered, and 735,000 have died
11 August 2020	Russia announced the approval of its Sputnik V vaccine for emergency use, though one month later only small amounts of the vaccine had been distributed for use outside of the phase 3 trial
10 October 2020	Second wave of Covid-19 occures in Czech Republic
20 October 2020	According to Johns Hopkins University, the number of worldwide coronavirus infections have surged past 40 million
17 November 2020	France surpasses 2 million COVID-19 cases
26 November 2020	According to Johns Hopkins University, the global coronavirus infections have surpassed 60 million
15 December 2020	British authorities reported the appearance of a more contagious mutation in December.
19 December 2020	South Africa of a new mutation of the coronavirus SARS-CoV-2 is detected
20 December 2020	Italy reported the first case of a person testing positive for the new "English variant"
21 December 2020	Many countries and the European Union have authorized or approved the Pfizer-BioNTech COVID-19 vaccine
26 December 2020	The total number of COVID-19 cases across the world crossed over 80 million, with the number of deaths due to the virus standing at more than 1.75 million
6 January 2021	A Covid-19 vaccine developed by Moderna is granted a conditional market authorisation in the EU. It is the second vaccine authorised, following a positive scientific recommendation by the European Medicines Agency.
9 January 2021	Marks the one year anniversary since the first death of COVID-19 in Wuhan, China
29 January 2021	A Covid-19 vaccine developed by AstraZeneca is granted a conditional marketing authorization. It is the third vaccine authorized, following a positive scientific recommendation by the European Medicines Agency.
2 February 2021	Czech Republic passes 1 million cases, making it the 20th country to do so
9 February 2021	Spain surpasses 3 million COVID-19 cases.

Source: Own processing based on: (Brodeur et al. 2020), (John Hopkins Coronavirus Resource Center 2021)

Figure 2. Number of coronavirus (COVID-19) cases, recoveries, tests, and deaths among the most impacted countries worldwide as of 21.02.2021

#	Country, Other	Total Cases	Total Deaths	Total Recovered	Active Cases	Total Tests	Population
1	USA	28,739,440	510,464	18,931,920	9,297,056	347,735,213	332,246,210
2	India	11,004,795	156,411	10,696,696	151,688	210,931,530	1,388,678,977
3	Brazil	10,139,148	246,006	9,067,939	825,203	28,600,000	213,526,848
4	Russia	4,164,726	83,293	3,713,445	367,988	109,000,000	145,974,661
5	UK	4,115,509	120,580	2,494,218	1,500,711	84,710,387	68,114,554
6	France	3,583,135	84,147	247,127	3,251,861	49,251,253	65,366,217
7	Spain	3,133,122	67,101	*2,497,956*	568,065	37,334,915	46,766,412
8	Italy	2,809,246	95,718	2,324,633	388,895	38,058,939	60,404,661
9	Turkey	2,638,422	28,060	2,523,760	86,602	32,318,182	84,919,015
10	Germany	2,393,134	68,398	2,190,600	134,136	42,872,730	83,955,812
11	Colombia	2,222,018	58,685	2,115,470	47,863	11,130,308	51,229,489
12	Argentina	2,060,625	51,122	1,861,433	148,070	7,106,842	45,461,026
13	Mexico	2,038,276	179,797	1,590,696	267,783	5,266,415	129,798,529
14	Poland	1,638,767	42,171	1,378,414	218,182	9,490,578	37,819,963
15	Iran	1,574,012	59,483	1,344,791	169,738	10,444,695	84,679,201

Source: (Worldometers 2021)

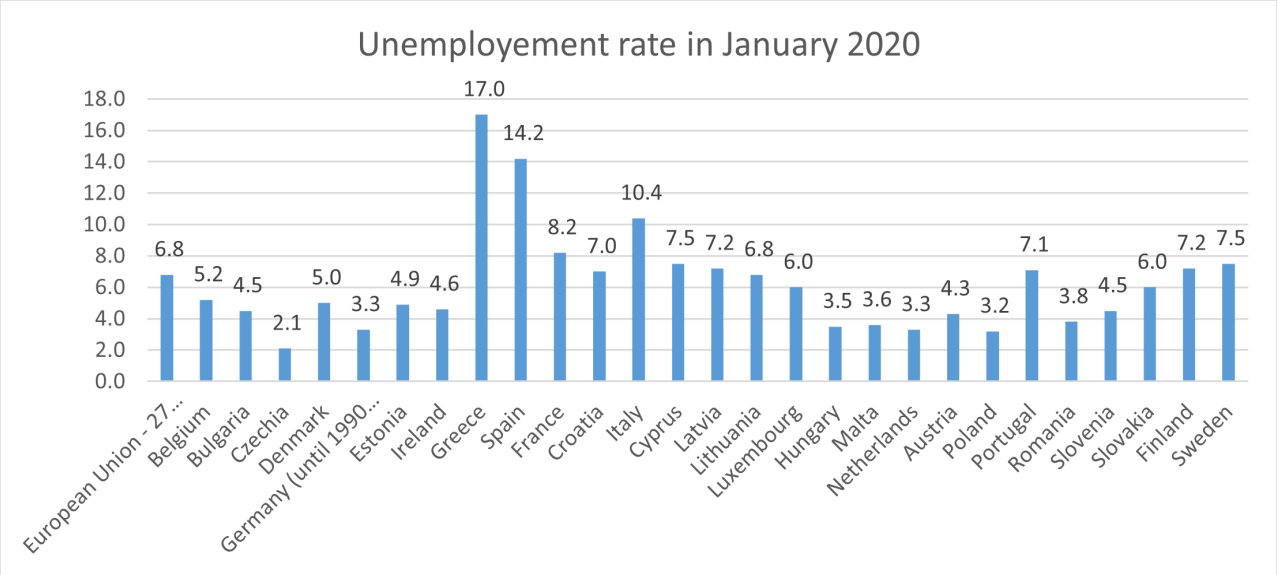
Figure 3. Number of coronavirus (COVID-19) cases, recoveries, tests and deaths in Europe as of 21.02.2021

#	Country, Other	Total Cases	Total Deaths	Total Recovered	Active Cases	Total Tests	Population
1	Russia	4,164,726	83,293	3,713,445	367,988	109,000,000	145,974,661
2	UK	4,115,509	120,580	2,494,218	1,500,711	84,710,387	68,114,554
3	France	3,583,135	84,147	247,127	3,251,861	49,251,253	65,366,217
4	Spain	3,133,122	67,101	*2,497,956*	568,065	37,334,915	46,766,412
5	Italy	2,809,246	95,718	2,324,633	388,895	38,058,939	60,404,661
6	Germany	2,391,368	68,378	2,190,600	132,390	42,872,730	83,955,812
7	Poland	1,638,767	42,171	1,378,414	218,182	9,490,578	37,819,963
8	Ukraine	1,304,456	25,103	1,146,073	133,280	6,651,624	43,564,467
9	Czechia	1,153,159	19,214	1,014,997	118,948	7,439,719	10,721,735
10	Netherlands	1,056,639	15,217	N/A	N/A	6,970,400	17,159,207
11	Portugal	797,525	15,962	699,222	82,341	7,977,384	10,177,579
12	Romania	779,695	19,847	724,333	35,515	5,874,883	19,154,977
13	Belgium	752,379	21,887	51,516	678,976	9,148,606	11,621,963
14	Sweden	631,166	12,649	N/A	N/A	5,708,037	10,139,603
15	Switzerland	547,775	9,886	*497,394*	40,495	4,857,927	8,695,142

Source: (Worldometers 2021)

4.2 Unemployment

Figure 4. Unemployment rate in EU and its members (in percentages)



Source : Own processing based on eurostat.eu data

Figure 5. Unemployment rate monthly and annual comparison of 2020 with average of 2018/19

	CHANGE IN PERCENTS												
GEO/TIME	Jan	Feb	March	April	May	June	July	August	September	October	November	December	Annual Change
European Union - 27 cc	-11%	-11%	-11%	-8%	-1%	5%	13%	16%	13%	11%	8%	10%	2%
Belgium	-13%	-13%	-14%	-17%	-16%	-8%	6%	17%	20%	16%	11%	6%	-1%
Bulgaria	-17%	-19%	-9%	22%	26%	19%	12%	9%	12%	14%	11%	9%	7%
Czechia	-13%	-14%	-10%	0%	14%	33%	33%	22%	27%	51%	44%	48%	19%
Denmark	-7%	-5%	-9%	-8%	7%	26%	31%	28%	20%	17%	11%	16%	10%
Germany (until 1990 for	-6%	-3%	9%	28%	38%	38%	38%	36%	40%	42%	40%	42%	28%
Estonia	-11%	-13%	-1%	22%	39%	65%	63%	67%	61%	74%	74%	No data	39%
Ireland	-12%	-12%	-10%	-16%	-14%	-2%	19%	29%	35%	21%	15%	11%	5%
Greece	-16%	-20%	-16%	-17%	-6%	2%	-11%	-5%	-4%	-9%	-10%	No data	-10%
Spain	-10%	-11%	-4%	1%	4%	9%	12%	15%	15%	14%	14%	15%	6%
France	-14%	-16%	-9%	-17%	-18%	-21%	7%	3%	2%	1%	3%	3%	-6%
Croatia	-28%	-27%	-19%	-1%	11%	11%	11%	12%	13%	9%	8%	7%	-2%
Italy	-10%	-11%	-33%	-41%	-22%	-6%	9%	13%	3%	-2%	-18%	-9%	-11%
Cyprus	-26%	-27%	-22%	-6%	1%	-1%	1%	13%	26%	44%	8%	5%	-2%
Latvia	-5%	-3%	3%	17%	24%	26%	29%	29%	28%	24%	25%	22%	17%
Lithuania	0%	3%	9%	33%	48%	45%	51%	59%	68%	79%	70%	56%	42%
Luxembourg	7%	7%	17%	32%	35%	35%	26%	21%	20%	19%	21%	22%	22%
Hungary	-5%	-1%	4%	15%	33%	37%	30%	21%	19%	24%	22%	No data	18%
Malta	-1%	-11%	3%	19%	23%	27%	24%	28%	29%	27%	24%	28%	18%
Netherlands	-21%	-21%	-18%	-4%	0%	22%	27%	27%	21%	22%	14%	17%	6%
Austria	-17%	-7%	-1%	4%	31%	43%	24%	18%	23%	11%	23%	30%	14%
Poland	-25%	-22%	-18%	-13%	-9%	-4%	-3%	-6%	-6%	-1%	-3%	-4%	-10%
Portugal	-5%	-8%	-11%	-9%	-15%	9%	19%	22%	19%	14%	6%	-4%	3%
Romania	-15%	1%	9%	27%	37%	45%	38%	37%	32%	32%	24%	22%	23%
Slovenia	-19%	-16%	-11%	6%	12%	11%	4%	6%	5%	9%	15%	14%	2%
Slovakia	-10%	-7%	-6%	6%	7%	10%	17%	21%	17%	19%	20%	22%	9%
Finland	-8%	-14%	-8%	-2%	17%	22%	23%	19%	25%	18%	14%	37%	10%
Sweden	11%	21%	0%	21%	32%	36%	36%	36%	41%	33%	22%	36%	27%

Source: Own processing based on eurostat.eu data

The unemployment rate is the number of jobless people as a level of the workforce based on the International Labor Office (ILO) definition. Because of its international comparability and relatively fast availability, the International Labor Organization's concept of the unemployment rate is the most commonly used labor market measure.

The Unemployment rate is a significant pointer with both social and financial measurements. Rising joblessness brings about a deficiency of pay for people expanded pressing factor concerning government spending on friendly advantages and a decrease in charge income. From a monetary viewpoint, unemployment might be seen as an unused word limit. (Eurostat.eu 2020)

Figure 4 indicates the unemployment rate of the European Union and its 27 members as of January 2020, from the figure it can be seen that the highest unemployment rate is in Greece and the lowest is in Czech Republic. Figure 5 displays monthly change in percentages of unemployment in the European Union and its member states, and it also displays the annual changes in 2020 in contrast with previous periods. In this figure, monthly average data of 2018 and 2019 compared to monthly data of 2020. From the figure 5, it can easily be observed that in many countries in the first quarter of 2020 unemployment rate was steadily decreasing compared to 2018/19 years. From second-quarter unemployment rate started sharply increasing in most countries, especially in the countries such as Czechia, Germany, Estonia, Lithuania, Luxembourg, Romania. The study shows that unemployment has risen in the second quarter after Covid-19 invaded Europe from China at the end of February, with lock-down measures implemented by several countries starting in early March. In the third-quarter, the growth of unemployment continued increasing, but at a slower pace in contrast to the second quarter in most countries. However, in the third-quarter unemployment growth kept skyrocketing in Estonia and Lithuania with an average of 70% monthly, the reason for the continued growth in these countries is the strict lockdown measures since the rate of unemployment is regarded as a lagging indicator. It normally takes several months for the unemployment rate to begin to increase after an economic downturn. As the figure indicates the annual rise of unemployment European Union in 2020 was 2% higher than the previous periods which is not a dramatic increase considering of time businesses were shut down because of the pandemic. In some countries such as Czechia, Germany, Estonia, Lithuania, Luxembourg, Romania unemployment rate has significantly grown to compare pre-pandemic period. We can also see one more interesting fact that the annual unemployment rate in Sweden increased by 27%, despite the Swedish government has not implemented strict prevention measures across the country. Basically, it means customers fear contracting a new virus, stoppage of external cash flow which is bounded with the tourism industry, and foreign investments played role in thousands of job losses.

On the basis of the information provided in figures 4 and 5, it can be stated that even there is an outbreak of Covid-19, the unemployment still goes down in some European counties. As the study reveals in most popular tourist attractive countries such as France, Italy, Greece, Cyprus annual unemployment rate was much lower than in the previous periods. Based on the analysis, the economist consider it is mainly driven by the decline in the number of inactive workers. *"The decline in the unemployment rate was mostly for bad reasons—people dropping out of the labor force, not people getting jobs," Shierholz said*. European Commission’s the forecast project specifies *"The unemployment rate in the EU*

is forecast to rise from 6.7% in 2019 to 7.7% in 2020 and 8.6% in 2021, before declining to 8.0% in 2022."

4.3 Import-Export

Figure 6. Import-Export monthly comprasion of 2020 with average of 2018/2019

	2018&2019 average, million USD											
	January	February	March	April	May	June	July	August	September	October	November	December
Export	179 568	179 951	203 781	191 736	195 540	193 758	201 550	178 420	186 700	208 414	194 168	182 696
Import	206 991	180 400	194 729	191 714	191 211	186 350	201 999	189 708	190 313	211 942	195 308	174 839
	2020 average, million USD											
	January	February	March	April	May	June	July	August	September	October	November	December
Export	176 086	185 776	194 474	135 575	141 099	173 089	193 094	146 164	167 684	187 284	179 494	191 070
Import	197 850	161 305	163 671	135 673	133 976	150 191	163 193	142 288	149 489	165 980	163 972	163 756
	Change in Percentage											
Export	-2%	3%	-5%	-29%	-28%	-11%	-4%	-18%	-10%	-10%	-8%	5%
Import	-4%	-11%	-16%	-29%	-30%	-19%	-19%	-25%	-21%	-22%	-16%	-6%

Source: Own processing based on Comtrade.org data

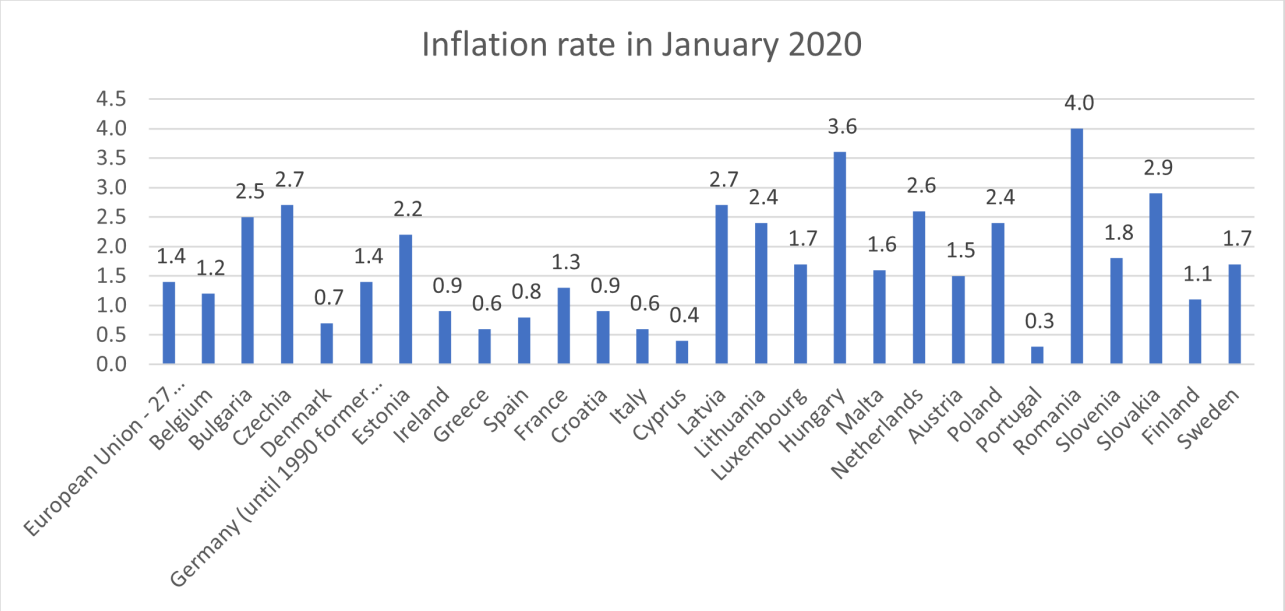
Exporting is the selling of goods and services that are sourced or manufactured in the home country to foreign countries. Importing is the process of purchasing goods and services from other countries and bringing them back to one's own country.

The EU is a major player in global trade: in 2018, it was the world's second-largest exporter and importer of commodities, as extra-EU trade accounting for 15.8% of global exports and 14.1 percent of global imports. (Eurostat.eu 2021)

The information presented in Figure 6 displays the value of export and import in millions of USD. The figure also indicates the monthly average value of 2018/19 is compared to 2020, in addition, analysed monthly changes shown in percentages. As it can be observed the trade sector has a quite similar progression with unemployment section. In the First quarter of 2020, there is a slight decrease compared to last year. Later, the outbreak of COVID-19 and the measures to tackle it caused a rapid decline in imports and exports from early March. We can notice a slight increase in the second quarter of export and import compared to the first quarter but still, it is followed by a critical decline in the trade sector until November. By the end of fourth-quarter we can observe a significant rise in the trade sector and the results of January and December quite similar and stable, but still the average annual decline in 2020 of export -10%, Import – 18%. The outbreak of COVID-19 is first and foremost a global health emergency, and this crisis is also impacting the global trade economy by disrupting international trade flows. Hundreds of thousands of European businesses and workers depend on the free movement of goods and services both inside and beyond the European Union. For import and export companies, this crisis is resulting in vastly reduced business, costing countless people their jobs. (European Parliament 2020) Based on analysis it can be concluded that Covid-19 and its impact on the Trade sector of the European Union were crucial.

4.4 Inflation rate

Figure 7. Inflation rate in EU and its members (in percentages)



Source: Own processing based on eurostat.eu data

Figure 8. Inflation rate monthly comparison of 2020 with average of 2018/19

	Monthly Inflation Change Index												Annual
GEO/TIME	January	February	March	April	May	June	July	August	September	October	November	December	Average
European Union - 27	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.7
Belgium	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3
Bulgaria	1.3	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.9
Czechia	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.4	1.4
Denmark	0.8	0.8	0.6	0.6	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.6
Germany (until 1990	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.2	0.6
Estonia	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.1	0.0	-0.1	-0.1	-0.2	0.3
Ireland	1.6	1.6	1.6	1.2	0.9	0.6	0.4	0.3	0.0	-0.1	-0.4	-0.6	0.6
Greece	0.7	0.6	0.6	0.4	0.3	0.0	-0.3	-0.5	-0.9	-1.2	-1.5	-2.0	-0.3
Spain	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.0	0.0	-0.1	-0.2	-0.2	0.1
France	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.6
Croatia	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.0	0.4
Italy	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	-0.1	-0.1	0.2
Cyprus	0.5	0.7	0.5	0.3	0.0	-0.3	-0.6	-1.1	-1.2	-1.4	-1.5	-1.7	-0.5
Latvia	1.0	1.0	0.9	0.8	0.7	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.5
Lithuania	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6
Luxembourg	0.9	0.9	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.4
Hungary	1.3	1.4	1.4	1.3	1.2	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.2
Malta	1.1	1.0	1.0	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.5	0.8
Netherlands	1.8	1.7	1.5	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	1.1
Austria	0.7	0.7	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Poland	1.8	2.0	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2
Portugal	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	-0.1	-0.1	0.1
Romania	1.5	1.4	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	1.0
Slovenia	1.0	1.1	1.1	0.9	0.8	0.6	0.5	0.3	0.2	0.1	0.0	-0.2	0.5
Slovakia	1.5	1.4	1.4	1.3	1.2	1.1	1.1	1.0	1.0	0.9	0.8	0.8	1.1
Finland	1.1	1.0	1.0	0.9	0.7	0.6	0.7	0.5	0.5	0.4	0.4	0.3	0.7
Sweden	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.6

Source: Own processing based on eurostat.eu data

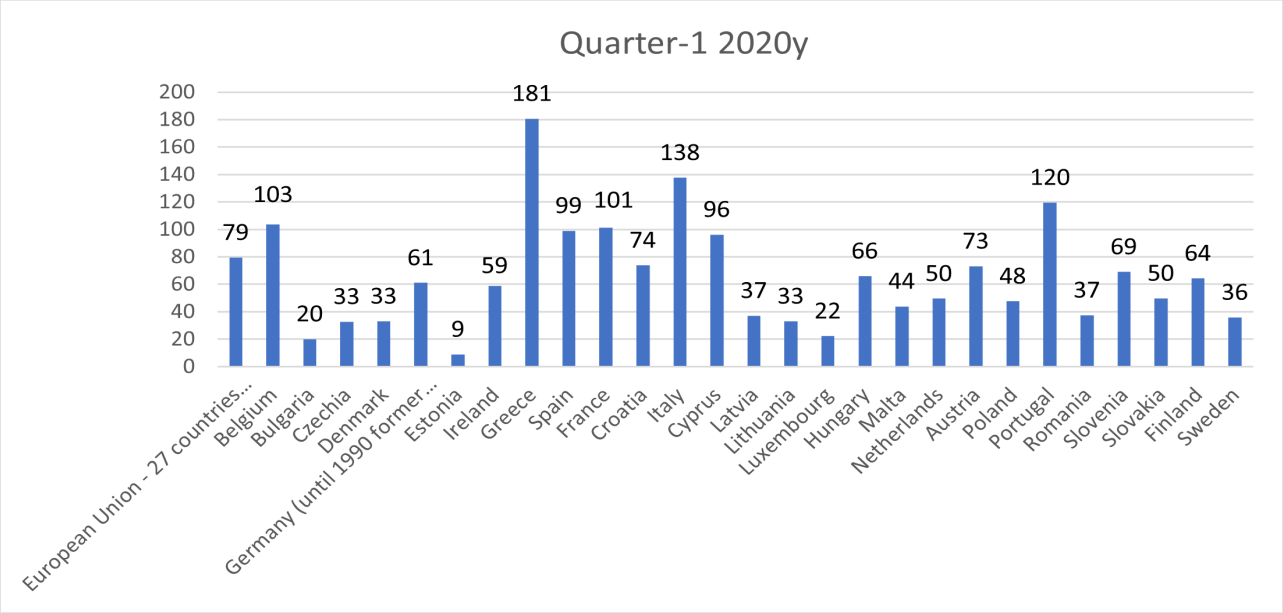
Inflation is described as an increase in the price of goods and services in the economy. A more precise description of inflation is a steady rise in an economy's overall price level. this term is the opposite of deflation. Figure 7 displays the information about inflation rate in European Union and its members as of January 2020. Figure 8 demonstrates the Inflation rate change in the index, monthly average data of 2018/19 compared to data of 2020.

From the figure above it can be seen that almost all European counties had progressive inflation throughout the year compared to the previous period. Based on the information that figure 8 provides, we can divide counties into 3 major groups: counties that have high inflation, countries that have medium inflation, and countries that have high inflation. Low affected counties are that have the index change from 0 to 0.8 index change, members like Belgium, Germany, Denmark, Spain, Italy, France, and so on. Moderately affected countries are that the index change from 0.8 to 1.1 index change, members like Bulgaria, Slovakia, Romania, the Netherlands. Highly affected countries are that have the index change above 1.1, countries such as Czechia, Hungary, Poland. Inflation crucial damage to the economy because it is the loss of consumer purchase power. From all countries mentioned above Poland claims special emphasis to look at the situation deeper. Poland has an annual inflation index of 2.2 compared to previous periods, which is basically means the inflation was two times higher in 2020. Inflation is the pace at which the overall price level of selected goods and services in an economy rises over time, indicating a reduction in the local currency's buying power. Inflation is caused by a rise in the supply of capital, which can occur through a variety of processes in the economy. The monetary authorities may increase the money supply by printing and handing out more money to individuals, by legally devaluing (decreasing the value of) the legal tender currency, more (most commonly) by creating new money in the financial system as reserve account credits through buying government bonds from banks on the secondary market. When the money supply is increased in this way, the money loses its buying power. The cause of inflation in Poland remains to be examined by economists.

Also, Figure 8 provides information about two extraordinary cases with negative inflation (deflation). As we can observe the inflation rate of Greece and Cyprus was steadily increasing until the end of the second quarter, however from the third quarter counties started facing significant deflation until the end of the year with an index of -2 which basically means the prices for assets and services became two times cheaper than the same period of past years. Deflation in Greece and Cyprus may be caused by a combination of different factors, including a lack of money in circulation, which increases the value of that money and, in turn, reduces prices; Having more goods produced than there is a demand for, which means that businesses must lower their prices in order to get people to buy those goods; Not having enough money in circulation, which causes those with money to be held. Although lower prices can seem to be a positive thing, deflation can have a negative impact on the economy, such as when it leads to high unemployment and can transform a terrible situation, such as a recession, into an even worse situation, such as depression. European Commission’s European economic forecast says *"Inflation in the euro area and the EU is expected to be slightly higher in 2021 compared to last autumn, but to remain subdued despite a temporary boost from base effects. In the euro area, inflation is forecast to increase from 0.3% in 2020 to 1.4% in 2021 before moderating slightly to 1.3% in 2022."*

4.5 Government Debt

Figure 9, Government debt to GDP in percentages (Quarter-1)



Source: Own processing based on eurostat.eu data

Figure 10. Quarterly government debt comparison of 2020 to average of 2018/19

	Change in Percentages			Average
GEO/TIME	Q1	Q2	Q3	Q1/Q3
European Union - 27 cou	-1%	9%	12%	5%
Belgium	0%	11%	10%	5%
Bulgaria	-10%	-3%	17%	3%
Czechia	-5%	18%	18%	7%
Denmark	-4%	18%	23%	9%
Germany (until 1990 form	-3%	9%	13%	5%
Estonia	7%	109%	114%	61%
Ireland	-11%	-4%	-3%	-7%
Greece	-2%	5%	8%	3%
Spain	0%	12%	16%	8%
France	2%	15%	17%	10%
Croatia	-2%	12%	16%	7%
Italy	1%	9%	13%	7%
Cyprus	0%	10%	18%	9%
Latvia	-1%	14%	18%	9%
Lithuania	-5%	18%	31%	13%
Luxembourg	5%	14%	26%	16%
Hungary	-6%	1%	8%	1%
Malta	-7%	10%	22%	8%
Netherlands	-7%	5%	8%	1%
Austria	-3%	11%	8%	2%
Poland	-5%	12%	18%	6%
Portugal	-4%	3%	7%	1%
Romania	10%	20%	25%	17%
Slovenia	-4%	12%	13%	5%
Slovakia	-2%	18%	20%	9%
Finland	8%	13%	12%	10%
Sweden	-5%	0%	4%	0%

Source: Own processing based on eurostat.eu data

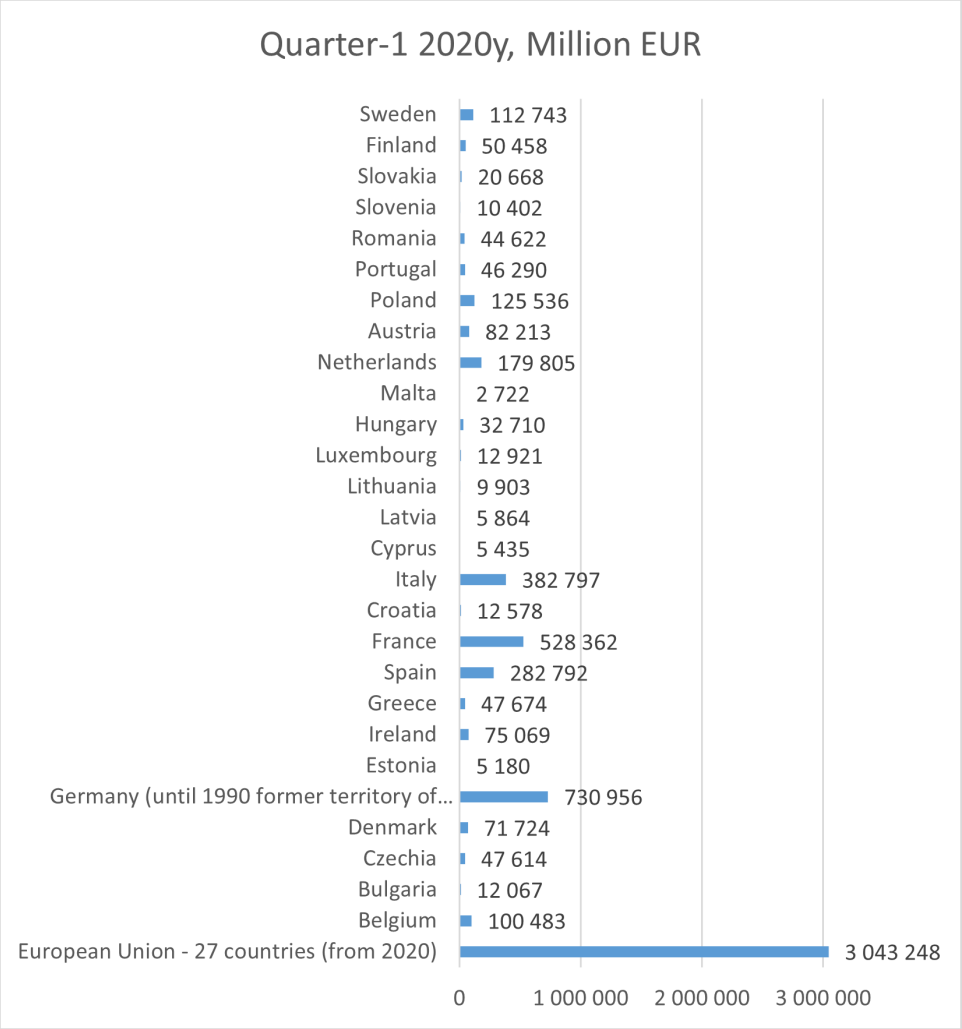
Figure 9 displays the Government debt to GDP of the European Union and its all member states in percentages for the first quarter of 2020. The First-quarter of 2020 is a less affected period by Covid-19 comparing to the following quarters because the outbreak began spreading in Europe by the end of February. So it is important to have information about the pre-pandemic period. From the information presented in figure 9 we can see that the highest rate of Government debt has Greece, and the lowest rate has Estonia.

Figure 10 provides the information about changes in percentages of comparing quarterly government debt of 2020 to an average of 2018/2019. The figure also demonstrates the change in the first quarter and third quarter in 2020. In the first quarter of 2020, we can see negative results compared to the previous period which actually means that government debts in the first quarter were lower than in the previous period. First positive quarter followed by significant increase of Government debt in the second quarter in all countries except Bulgaria and Sweden. Based on the analysis we can state that the reason surge of governmental debt is due to the lockdowns, the closure of educational institutions, all kind of non-essential services, the closure of all businesses which is dramatical damage to the economy, and mainly expenses on medical supplies to maintain overwhelming hospitals and governmental expenses on financial aids to businesses and individuals In the third quarter government debts kept increasing significantly even more than the second quarter, based on this information we can state that a higher amount of governmental expenses and social paychecks were distributed. The Fourth-quarter of 2020 is not analysed due to the limited dataset, however, based on outcomes of other similar industries we can predict that the growth of government debt in the fourth quarter of 2020 would be slightly higher compared to the third quarter.

On the basis of provided data in Figure 10, we can observe in the second and third quarters tremendous rapid growth of government debt of Estonia which increased by 109%. Information in Figure 9 shows that government debt to GDP of Estonia is 9% which is the lowest rate among European Union members. Accordingly, 9% increased by 109% resulting in 18.5% of government debt to GDP. If we have a look at Figure 9 even after such growth, Estonia's indicator of government debt fairly stable rate. Greece has a government debt to a GDP of 181% which means the governmental debt is two times higher than the GDP of the country. The highest governmental debt holder countries are Greece, Italy, Cyprus, Portugal, Belgium. Almost all member states experienced annual growth of government debt except Ireland with -7%.

4.6 GDP

Figure 11. Gross Domestic Product in million EURO (Quarter-1)



Source : Own processing based on eurostat.eu data

The figure 11 demonstrates information about Gross Domestic Product of first quarter of 2020 of European Union and its all 27 member states. The unit of measure is presented in EURO which is common european currency. As it can be observed the country with the biggest GDP is Germany, and the counry with the lowest GDP in European Union is Estonia.

Figure 12, Quarterly comparison of GDP of 2020 to average of 2018/19 (in percentages)

Changes in percentages				
GEO/TIME	2020Q1	2020Q2	2020Q3	2020Q4
European Union - 27	-2%	-13%	-3%	-4%
Belgium	-1%	-13%	-3%	No data
Bulgaria	4%	-7%	-4%	No data
Czechia	-1%	-10%	-4%	No data
Denmark	2%	-6%	-2%	-1%
Germany (until 1990	-2%	-11%	-4%	-3%
Estonia	3%	-3%	-1%	No data
Ireland	6%	-1%	11%	No data
Greece	1%	-13%	-11%	No data
Spain	-3%	-21%	-8%	-8%
France	-5%	-18%	-3%	-5%
Croatia	2%	-14%	-9%	No data
Italy	-5%	-18%	-5%	-7%
Cyprus	3%	-11%	-3%	No data
Latvia	1%	-8%	-2%	-2%
Lithuania	5%	-3%	0%	1%
Luxembourg	1%	-7%	1%	3%
Hungary	5%	-12%	-3%	No data
Malta	4%	-15%	-7%	No data
Netherlands	0%	-9%	-2%	-2%
Austria	-2%	-14%	-3%	-8%
Poland	5%	-6%	0%	-1%
Portugal	-1%	-16%	-5%	No data
Romania	5%	-9%	-4%	0%
Slovenia	-1%	-12%	-2%	No data
Slovakia	-2%	-11%	-1%	-2%
Finland	-1%	-5%	-2%	No data
Sweden	1%	-7%	-1%	-2%

Source: Own processing based on eurostat.eu data

Figure 12 provides a quarterly comparison of the Gross Domestic Product of 2020 to an average of 2018/19, the changes are displayed in percentages. A quite similar plot of events with other industries can be seen in the figure above. The First-quarter of 2020 shows that most of the countries have a slight growth in their GDP in comparison with the previous period. The second-quarter plunged into tremendous fallout of GDP in all 27 member states with an average negative number in -14% GDP in contrast with the previous period. Germany experienced a GDP drop of -11% which is very costly to GDP that is 731 million EUR. The reasons for such tremendous fallout of GDP are obvious, the spread of Covid-19 across Europe at the end of the first quarter and the governmental preventive measures such as quarantine and lockdowns has lead to significant loss of GDP in the second quarter. The third quarter continued with noticeable decreases of GDP in all member countries except Ireland and Luxembourg with indicators of 11% and 1% GDP growth in the quarter of 2020 compared to the previous period. There is a lack of information for some countries in the fourth quarter of 2020, nevertheless on the basis of indicators of the third quarter we are able to predict that GDP in the fourth quarter would be declining negatively. We can also conclude that countries such as Greece, Portugal, and Spain that are more reliant on tourism (more than 15% of GDP) are more affected by this crisis. European Commission's European economic forecast says *"Overall, GDP is now*

forecast to grow by 3.7% in 2021 and 3.9% in 2022 in the EU, and by 3.8% in both years in the euro area. The EU economy would reach the pre-crisis level of output earlier than anticipated back in the Autumn Forecast, largely because of the stronger momentum in the second half of 2021 and in 2022. The speed of the recovery will, however, vary significantly across the EU. Some countries have suffered more during the pandemic than others, whereas some are more dependent on sectors such as tourism, which are likely to remain weak for some time. As a result, while some Member States are expected to see economic output return to their pre-pandemic levels by the end of 2021 or early 2022, others are forecast to take longer."

5 Conclusion

The COVID-19 pandemic was triggered by the spread of the SARS-CoV2 virus among people around the world. It has caused a widespread global shock, causing a significant economic slowdown. There has been a slowdown in all economic sectors worldwide and more than one-third of the world's population has been locked up. The goal of the thesis was to analyse the economic impact of Covid-19 on the following indicators, namely, unemployment rate, inflation rate, import-export, government debt, and GDP in the European Union.

The main goal of the thesis was to assess the impact Covid-19 on economy of European Union. The thesis aimed to answer five questions related to selected indicators. The first question is: Which countries were most affected by unemployment during Covid-19? The unemployment rate in the European Union was 6.8% as of January 2020, and the study indicates that the annual growth of unemployment in the EU was 2% higher compared to an average of 2018/19. As we have researched the changes in unemployment, it can be concluded that the European countries such as Czechia, Germany, Estonia, Lithuania, Luxembourg, Romania, and Sweden were hardly affected by unemployment during Covid-19. France, Italy, Greece, Cyprus has experienced a decrease in unemployment despite the spread of an outbreak.

The second question is: Which countries had a high inflation rate due to Covid-19? The inflation rate in European Union was 1.4% as of January 2020, and the analysis shows an annual average growth of inflation in 2020 was 0.7%. On the basis of reliable analysis, it can be concluded that the Czech Republic, Hungary, and especially Poland were high inflation experienced countries during Covid-19. Greece and Cyprus experienced the opposite process, negative inflation (deflation) due to the decrease of consumer prices.

The third question is: How much the trade sector was affected during the pandemic? Probably the Trade sector is the most suffered industry due to Covid-19. The annual decline of exports European Union is 10% compared to previous periods. European Union’s annual imports declined by 18% during Covid-19, as a result of globally disrupted supply chains, and lock-down measures taken by countries across Europe to prevent the spread of Covid-19.

The fourth question is: How much Covid-19 has reduced GDP in the countries of the European Union? The whole European Union and its 27 members have experienced a decrease in GDP in 2020. The countries had a dramatic fallout of GDP in the second quarter of 2020 with an average decrease of 20%. The annual average decrease of GDP in 2020 made up negative 6%.

The fifth question: Which countries plunged into national debt the most during the pandemic? Greece, Portugal, and Italy have the highest government debts to GDP as of the first quarter of 2020. The government debt of Estonia skyrocketed by averagely by 100% during Covid-19 and made up 18% of government debt to GDP which was 9% prior to the outbreak. But still, Estonia’s government debt much lower compared to Greece, Portugal, and Italy.

According to predictions of the European Commission’s forecast project, Overall GDP is now forecasted to grow by 3.7% in 2021 and 3.9% in 2022 in the EU, and by 3.8%. And also In the euro area, inflation is forecast to increase from 0.3% in 2020 to 1.4% in 2021 before moderating slightly to 1.3% in 2022. Last but not least the unemployment rate in the EU is forecast to rise from 7.7% in 2020 to 8.6% in 2021, before declining to 8.0% in 2022.

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7 Appendix

Figure 13. Unemployment by sex and age – monthly average data of 2018/19 from Eurostat. Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data), UNIT: Percentage of active population.

GEO/TIME	1	2	3	4	5	6	7	8	9	10	11	12
European Union -	7.7	7.7	7.5	7.2	6.9	6.8	6.7	6.7	6.7	6.9	6.9	6.7
Belgium	6.0	5.9	5.8	5.9	5.7	5.6	5.8	5.7	5.5	5.5	5.4	5.5
Bulgaria	5.5	5.4	5.3	5.1	4.9	4.6	4.5	4.3	4.2	4.3	4.4	4.5
Czechia	2.4	2.2	2.1	2.1	2.1	2.0	2.3	2.3	2.2	2.1	2.0	2.1
Denmark	5.4	5.5	5.4	5.2	4.9	4.7	4.9	5.0	5.2	5.0	5.1	5.0
Germany (until 19	3.5	3.5	3.5	3.4	3.2	3.3	3.2	3.3	3.2	3.1	3.2	3.1
Estonia	5.5	5.8	5.1	5.1	5.1	4.9	4.7	4.6	4.9	4.6	4.3	4.4
Ireland	5.3	5.2	5.2	5.5	5.8	5.9	6.0	5.8	5.1	5.0	4.9	5.0
Greece	20.3	21.0	19.4	19.0	18.1	16.9	17.6	17.7	16.8	17.3	18.4	17.6
Spain	15.8	15.9	15.6	15.1	14.7	14.3	14.2	14.3	14.3	14.3	14.2	14.0
France	9.6	9.4	9.0	8.6	8.4	8.2	8.4	8.9	8.5	8.8	8.7	8.6
Croatia	9.7	9.5	8.8	7.8	6.9	6.6	6.6	6.5	6.4	7.1	7.3	7.4
Italy	11.6	11.3	11.1	10.9	10.0	9.8	9.6	8.4	9.9	10.6	10.5	10.1
Cyprus	10.2	10.1	9.2	7.3	6.6	7.1	7.9	7.6	6.5	5.7	7.6	7.7
Latvia	7.6	7.6	7.5	7.2	7.0	6.9	6.8	6.5	6.3	6.2	6.3	6.8
Lithuania	6.8	6.8	7.0	6.1	5.8	6.2	5.8	5.9	5.9	5.7	6.1	6.8
Luxembourg	5.6	5.7	5.7	5.6	5.4	5.4	5.7	5.6	5.4	5.5	5.5	5.8
Hungary	3.7	3.8	3.7	3.6	3.5	3.5	3.6	3.7	3.6	3.6	3.5	3.6
Malta	3.7	3.8	3.8	3.7	3.7	3.6	3.7	3.6	3.7	3.6	3.6	3.5
Netherlands	4.2	4.1	3.9	3.8	3.6	3.5	3.3	3.3	3.7	3.6	3.5	3.2
Austria	5.2	5.3	5.0	4.9	4.4	4.4	4.8	4.8	4.6	4.6	4.1	4.6
Poland	4.3	4.1	3.8	3.6	3.4	3.4	3.4	3.5	3.5	3.4	3.3	3.4
Portugal	7.5	7.4	7.2	6.9	6.6	6.4	6.3	6.5	6.6	6.6	6.8	7.0
Romania	4.5	4.4	4.3	4.1	4.0	3.8	3.9	3.8	3.9	4.0	4.1	4.1
Slovenia	5.6	5.5	5.2	4.8	4.7	4.7	5.0	5.0	4.7	4.3	4.0	4.2
Slovakia	6.7	6.5	6.3	6.2	6.2	6.2	6.2	6.1	6.2	6.0	5.9	5.8
Finland	7.8	8.0	7.9	8.3	9.1	6.5	6.3	6.5	6.1	6.3	6.1	5.7
Sweden	6.8	6.8	7.1	6.8	6.8	7.2	6.6	6.5	5.9	5.9	6.3	6.1

Figure 14. Unemployment by sex and age – monthly data of 2020 by Eurostat. Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data), UNIT: Percentage of active population.

GEO/TIME	2020M01	2020M02	2020M03	2020M04	2020M05	2020M06	2020M07	2020M08	2020M09	2020M10	2020M11	2020M12
European Union - 27 cou	6.8	6.8	6.6	6.6	6.8	7.1	7.6	7.7	7.6	7.6	7.4	7.4
Belgium	5.2	5.1	5.0	4.9	4.8	5.1	6.1	6.6	6.6	6.3	6.0	5.8
Bulgaria	4.5	4.4	4.8	6.2	6.1	5.4	5.0	4.7	4.7	4.9	4.9	4.9
Czechia	2.1	1.9	1.9	2.1	2.4	2.6	3.0	2.8	2.8	3.1	2.8	3.1
Denmark	5.0	5.2	4.9	4.8	5.2	5.9	6.4	6.4	6.2	5.8	5.6	5.8
Germany (until 1990 forn	3.3	3.4	3.8	4.3	4.4	4.5	4.4	4.5	4.4	4.4	4.4	4.4
Estonia	4.9	5.0	5.0	6.2	7.1	8.0	7.6	7.7	7.9	7.9	7.4	:
Ireland	4.6	4.6	4.7	4.6	5.0	5.8	7.1	7.4	6.9	6.0	5.6	5.5
Greece	17.0	16.8	16.3	15.8	16.9	17.3	15.6	16.8	16.1	15.8	16.5	:
Spain	14.2	14.1	15.0	15.3	15.2	15.5	15.9	16.4	16.4	16.2	16.1	16.1
France	8.2	7.9	8.2	7.1	6.9	6.4	8.9	9.1	8.7	8.8	9.0	8.9
Croatia	7.0	6.9	7.1	7.7	7.6	7.3	7.3	7.3	7.2	7.7	7.8	7.9
Italy	10.4	10.1	7.4	6.4	7.8	9.2	10.4	9.4	10.2	10.4	8.6	9.1
Cyprus	7.5	7.3	7.1	6.8	6.6	7.0	7.9	8.6	8.2	8.2	8.2	8.0
Latvia	7.2	7.3	7.7	8.4	8.6	8.6	8.7	8.4	8.0	7.7	7.9	8.3
Lithuania	6.8	7.0	7.6	8.1	8.6	9.0	8.7	9.3	9.9	10.2	10.4	10.6
Luxembourg	6.0	6.1	6.6	7.3	7.3	7.2	7.1	6.7	6.5	6.5	6.6	7.1
Hungary	3.5	3.7	3.8	4.1	4.6	4.8	4.6	4.4	4.3	4.4	4.2	:
Malta	3.6	3.4	3.9	4.4	4.5	4.5	4.6	4.6	4.7	4.5	4.4	4.4
Netherlands	3.3	3.2	3.2	3.6	3.6	4.2	4.2	4.2	4.4	4.4	4.0	3.7
Austria	4.3	4.9	4.9	5.1	5.7	6.2	5.9	5.6	5.6	5.1	5.0	5.9
Poland	3.2	3.2	3.1	3.1	3.1	3.2	3.3	3.3	3.3	3.3	3.2	3.2
Portugal	7.1	6.8	6.4	6.3	5.6	6.9	7.5	7.9	7.8	7.5	7.2	6.7
Romania	3.8	4.4	4.7	5.2	5.4	5.5	5.4	5.2	5.1	5.2	5.1	5.0
Slovenia	4.5	4.6	4.6	5.1	5.2	5.2	5.2	5.3	4.9	4.7	4.6	4.8
Slovakia	6.0	6.0	5.9	6.5	6.6	6.8	7.2	7.3	7.2	7.1	7.0	7.1
Finland	7.2	6.9	7.3	8.1	10.6	7.9	7.7	7.7	7.6	7.4	6.9	7.8
Sweden	7.5	8.2	7.1	8.2	9.0	9.8	8.9	8.8	8.3	7.8	7.7	8.2

Figure 15. Inflation rate - monthly data (12-month average rate of change) average of 2018/19 from Eurostat, UNIT: Moving 12 months average rate of change.

GEO/TIME	1	2	3	4	5	6	7	8	9	10	11	12
European Union - 2	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.6	1.6
Belgium	2.2	2.2	2.15	2.1	2.1	2.1	2.1	2	1.95	1.9	1.85	1.75
Bulgaria	2	2.05	2.15	2.2	2.25	2.3	2.4	2.45	2.45	2.5	2.5	2.55
Czechia	2.2	2.15	2.15	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.25	2.3
Denmark	0.9	0.9	0.95	0.9	0.95	0.9	0.9	0.8	0.75	0.75	0.7	0.7
Germany (until 199	1.8	1.8	1.8	1.8	1.8	1.8	1.75	1.75	1.7	1.65	1.65	1.65
Estonia	3.5	3.45	3.45	3.4	3.4	3.35	3.3	3.2	3.15	3	2.9	2.85
Ireland	0.55	0.55	0.55	0.6	0.65	0.7	0.75	0.7	0.75	0.8	0.8	0.8
Greece	0.9	0.85	0.85	0.85	0.8	0.8	0.75	0.75	0.7	0.65	0.65	0.65
Spain	1.85	1.75	1.65	1.65	1.6	1.6	1.5	1.45	1.4	1.3	1.25	1.25
France	1.65	1.6	1.65	1.6	1.6	1.7	1.7	1.65	1.7	1.7	1.65	1.7
Croatia	1.4	1.4	1.4	1.35	1.4	1.35	1.3	1.3	1.25	1.2	1.2	1.2
Italy	1.25	1.25	1.25	1.2	1.15	1.2	1.1	1.05	1	1	0.95	0.9
Cyprus	0.8	0.75	0.75	0.7	0.7	0.7	0.65	0.65	0.65	0.65	0.65	0.65
Latvia	2.7	2.7	2.65	2.65	2.7	2.75	2.75	2.7	2.7	2.7	2.65	2.65
Lithuania	3.1	3.05	3	2.95	2.95	2.9	2.85	2.75	2.65	2.5	2.45	2.35
Luxembourg	2	2	2	2	2	1.95	2	1.95	1.9	1.85	1.85	1.8
Hungary	2.7	2.7	2.7	2.75	2.85	2.95	3	3	3.05	3.05	3.1	3.15
Malta	1.45	1.5	1.5	1.5	1.5	1.55	1.6	1.65	1.65	1.65	1.6	1.6
Netherlands	1.45	1.5	1.6	1.65	1.7	1.8	1.85	1.95	2	2	2.05	2.15
Austria	2.15	2.15	2.1	2.05	2.05	2.05	2	2	1.95	1.9	1.85	1.8
Poland	1.35	1.3	1.3	1.35	1.35	1.4	1.45	1.5	1.55	1.55	1.6	1.65
Portugal	1.3	1.3	1.25	1.2	1.15	1.15	1.05	1	0.95	0.85	0.75	0.75
Romania	2.7	2.85	3	3.15	3.35	3.45	3.6	3.75	3.85	3.9	3.9	4
Slovenia	1.75	1.7	1.65	1.7	1.65	1.7	1.75	1.8	1.8	1.8	1.8	1.8
Slovakia	2	2.05	2.1	2.2	2.3	2.35	2.4	2.45	2.5	2.55	2.6	2.65
Finland	1	1.05	1.05	1	1.1	1.1	1.05	1.1	1.15	1.15	1.15	1.15
Sweden	2	1.95	2	2	2	2	1.95	1.9	1.85	1.9	1.9	1.85

Figure 16. Inflation rate - monthly data (12-month average rate of change) of 2020 from Eurostat, UNIT: Moving 12 months average rate of change

GEO/TIME	2020M01	2020M02	2020M03	2020M04	2020M05	2020M06	2020M07	2020M08	2020M09	2020M10	2020M11	2020M12
European Union - 27	1.4	1.4	1.4	1.3	1.2	1.2	1.1	1.0	1.0	0.9	0.8	0.7
Belgium	1.2	1.1	1.0	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4
Bulgaria	2.5	2.6	2.6	2.4	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.2
Czechia	2.7	2.8	2.9	3.0	3.0	3.1	3.2	3.3	3.3	3.4	3.3	3.3
Denmark	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Germany (until 1990	1.4	1.4	1.4	1.2	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.4
Estonia	2.2	2.2	2.1	1.7	1.3	1.0	0.7	0.4	0.1	-0.2	-0.4	-0.6
Ireland	0.9	0.9	0.9	0.7	0.6	0.4	0.3	0.2	0.0	-0.1	-0.3	-0.5
Greece	0.6	0.5	0.5	0.3	0.2	0.0	-0.2	-0.4	-0.6	-0.8	-1.0	-1.3
Spain	0.8	0.8	0.7	0.5	0.3	0.3	0.1	0.0	0.0	-0.1	-0.2	-0.3
France	1.3	1.3	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.5
Croatia	0.9	0.9	0.9	0.8	0.6	0.6	0.4	0.4	0.3	0.2	0.1	0.0
Italy	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.0	-0.1	-0.1
Cyprus	0.4	0.5	0.4	0.2	0.0	-0.2	-0.4	-0.7	-0.8	-0.9	-1.0	-1.1
Latvia	2.7	2.6	2.5	2.2	1.9	1.5	1.3	1.0	0.8	0.5	0.3	0.1
Lithuania	2.4	2.4	2.3	2.2	2.0	1.9	1.7	1.6	1.5	1.4	1.3	1.1
Luxembourg	1.7	1.7	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.3	0.2	0.0
Hungary	3.6	3.7	3.7	3.6	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.4
Malta	1.6	1.5	1.5	1.5	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.8
Netherlands	2.6	2.5	2.4	2.2	2.1	2.0	1.9	1.7	1.6	1.4	1.3	1.1
Austria	1.5	1.6	1.6	1.6	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.4
Poland	2.4	2.6	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7
Portugal	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	-0.1	-0.1
Romania	4.0	3.9	3.7	3.6	3.3	3.2	3.1	2.9	2.8	2.7	2.5	2.3
Slovenia	1.8	1.8	1.8	1.5	1.3	1.0	0.8	0.6	0.4	0.2	0.0	-0.3
Slovakia	2.9	2.9	2.9	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.1	2.0
Finland	1.1	1.1	1.1	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4
Sweden	1.7	1.6	1.6	1.4	1.2	1.1	1.1	1.0	1.0	0.9	0.8	0.7

Figure 17. GDP and main components (output, expenditure and income), quarterly average data of 2018/19 from Eurostat, UNIT: Chain linked volumes (2010), million euro, NA_ITEM: Gross domestic product at market prices

GEO/TIME	Q1	Q2	Q3	Q4
European Union - 27	3 096 679.2	3 108 860.6	3 115 247.1	3 126 721.2
Belgium	101 635.5	102 034.8	102 468.5	103 220.6
Bulgaria	11 563.8	11 651.6	11 745.3	11 833.5
Czechia	47 980.1	48 273.5	48 514.3	48 743.8
Denmark	70 639.9	71 144.3	71 578.6	71 849.7
Germany (until 1990	743 389.9	743 250.4	743 180.8	744 365.7
Estonia	5 013.9	5 053.2	5 082.7	5 126.8
Ireland	70 563.5	73 117.1	72 462.8	74 955.8
Greece	47 028.0	47 206.3	47 097.9	47 325.2
Spain	291 854.4	293 163.3	294 573.0	295 998.2
France	554 994.6	556 469.8	558 036.9	559 154.2
Croatia	12 307.6	12 504.3	12 538.0	12 588.3
Italy	404 998.7	405 641.7	405 627.2	405 062.8
Cyprus	5 262.3	5 311.7	5 339.3	5 396.4
Latvia	5 830.0	5 898.4	5 955.0	5 983.5
Lithuania	9 466.4	9 557.6	9 633.6	9 722.0
Luxembourg	12 744.2	12 813.6	12 907.9	12 935.8
Hungary	31 287.9	31 576.6	31 924.8	32 190.9
Malta	2 613.8	2 642.3	2 740.9	2 728.3
Netherlands	178 912.5	179 770.8	180 267.7	181 043.2
Austria	84 046.6	84 093.3	84 318.9	84 446.7
Poland	120 128.4	121 362.3	122 895.2	123 509.3
Portugal	46 864.5	47 184.7	47 401.2	47 657.6
Romania	42 384.2	42 911.5	43 315.7	43 612.1
Slovenia	10 544.5	10 611.0	10 723.1	10 799.1
Slovakia	21 162.7	21 315.0	21 453.9	21 565.2
Finland	50 982.0	51 214.0	51 220.5	51 148.0
Sweden	111 641.7	112 261.6	112 311.8	112 721.5

Figure 18. GDP and main components (output, expenditure and income), quarterly data of 2020 from Eurostat, UNIT: Chain linked volumes (2010), million euro, NA_ITEM: Gross domestic product at market prices

GEO/TIME	2020Q1	2020Q2	2020Q3	2020Q4
European Union - 27	3 043 248	2 697 643.0	3 008 909	2 996 804
Belgium	100 483	88 608.5	98 922.8	:
Bulgaria	12 067	10 851.8	11 316.4	:
Czechia	47 614	43 562.4	46 585.0	:
Denmark	71 724	66 868.7	70 344.7	70 772.3
Germany (until 1990	730 956	660 000.3	716 179.4	718 618.9
Estonia	5 180	4 895.7	5 055.1	:
Ireland	75 069	72 666.6	80 698.6	:
Greece	47 674	40 929.5	41 866.8	:
Spain	282 792	232 232.4	270 347.3	271 442.9
France	528 362	457 022.2	541 368.4	533 547.7
Croatia	12 578	10 692.6	11 427.3	:
Italy	382 797	332 866.9	386 013.6	378 387.4
Cyprus	5 435	4 723.8	5 166.8	:
Latvia	5 864	5 455.0	5 830.4	5 893.1
Lithuania	9 903	9 317.6	9 670.3	9 781.8
Luxembourg	12 921	11 979.8	13 098.1	13 305.2
Hungary	32 710	27 940.2	31 121.2	:
Malta	2 722	2 255.3	2 542.7	:
Netherlands	179 805	164 445.6	177 194.0	176 970.8
Austria	82 213	72 702.5	81 401.3	77 925.3
Poland	125 536	114 237.1	123 236.9	122 410.3
Portugal	46 290	39 848.6	45 129.4	:
Romania	44 622	39 196.2	41 570.5	43 773.8
Slovenia	10 402	9 384.1	10 548.3	:
Slovakia	20 668	18 952.0	21 160.0	21 195.8
Finland	50 458	48 502.0	50 032.0	:
Sweden	112 743	104 228.5	110 928.2	110 661.2

Figure 19. Quarterly government debt data of average of 2018/19 from Eurostat, NA_ITEM: Government consolidated gross debt, Sector: general government, UNIT: Percentage of gross domestic product (GDP)

GEO/TIME	Q1	Q2	Q3	Q4
European U	80.6	80.2	79.9	78.6
Belgium	103.9	103.0	102.5	99.0
Bulgaria	22.5	21.9	21.7	21.3
Czechia	34.4	33.7	32.5	31.2
Denmark	34.5	34.9	34.6	33.7
Germany (u	62.8	62.0	61.8	60.7
Estonia	8.3	8.9	8.7	8.3
Ireland	66.3	65.3	63.9	60.2
Greece	184.4	183.2	184.8	183.4
Spain	98.8	98.5	98.1	96.5
France	99.1	99.0	99.6	98.1
Croatia	75.3	75.8	74.5	73.5
Italy	135.8	136.7	136.3	134.6
Cyprus	96.2	102.8	101.6	96.6
Latvia	37.5	37.7	37.7	37.0
Lithuania	34.6	35.2	35.0	34.8
Luxembourg	21.2	20.9	20.7	21.5
Hungary	70.4	69.9	69.1	67.3
Malta	47.2	46.6	44.0	43.8
Netherlands	53.0	52.5	51.1	50.6
Austria	75.2	74.4	73.5	72.3
Poland	50.1	49.1	48.2	47.3
Portugal	124.6	122.8	122.3	119.4
Romania	34.2	34.0	34.6	35.0
Slovenia	71.7	70.2	69.6	68.0
Slovakia	50.7	50.9	50.7	49.2
Finland	59.8	60.7	59.8	59.5
Sweden	37.6	37.2	36.8	37.0

Figure 20. Quarterly government debt data of 2020 from Eurostat, NA_ITEM: Government consolidated gross debt, Sector: general government, UNIT: Percentage of gross doesti product (GDP)

GEO/TIME	2020Q1	2020Q2	2020Q3
European Union - 27 cou	79	87.7	89.8
Belgium	103	114.1	113.2
Bulgaria	20	21.3	25.3
Czechia	33	39.9	38.4
Denmark	33	41.2	42.4
Germany (until 1990 form	61	67.4	70.0
Estonia	9	18.5	18.5
Ireland	59	62.7	62.0
Greece	181	191.4	199.9
Spain	99	110.2	114.1
France	101	114.0	116.5
Croatia	74	84.8	86.4
Italy	138	149.3	154.2
Cyprus	96	113.3	119.5
Latvia	37	42.9	44.6
Lithuania	33	41.4	45.9
Luxembourg	22	23.9	26.1
Hungary	66	70.5	74.3
Malta	44	51.0	53.7
Netherlands	50	55.2	55.2
Austria	73	82.5	79.1
Poland	48	54.8	56.7
Portugal	120	126.0	130.8
Romania	37	40.8	43.1
Slovenia	69	78.3	78.5
Slovakia	50	60.3	60.8
Finland	64	68.6	66.9
Sweden	36	37.1	38.4