The effect of COVID19 on financial markets

Stipić, Dominik

University of Zagreb

Faculty of Economic and Business

Bachelor Degree in Business

The effect of COVID19 on financial markets

Undergraduate thesis

Dominik Stipić, JMBAG (Index number): 0067575630

Mentor: Ph.D., Jakša Krišto

Zagreb September, 7, 2021

_____

Name and family name of student

STATEMENT ON ACADEMIC INTEGRITY

I hereby declare and confirm with my signature that the _____ (type of the paper) is exclusively the result of my own autonomous work based on my research and literature published, which is seen in the notes and bibliography used. I also declare that no part of the paper submitted has been made in an inappropriate way, whether by plagiarizing or infringing on any third person's copyright. Finally, I declare that no part of the paper submitted has been used for any other paper in another higher education institution, research institution or educational institution.

Student:

In Zagreb, _____ _____

(date) (signature)

Abstract

Financial markets have been a critical medium for centuries to transfer and distribute the funds needed for the proper functioning of the economy. Well-functioning financial markets are a critical component of high economic growth, and badly performing financial markets are one of the reasons why many nations throughout the world stay impoverished. Financial market activities also have a direct impact on personal wealth, company and consumer behavior, and the economy's cyclical performance. Due to the extreme importance for the economy, it is essential that financial markets function properly, are stable and that imbalances in them are not the reasons for major economic crises. A sudden threat to that market stability in the last year and a half is the coronavirus pandemic. Due to the uncertainty surrounding the development of coronavirus-related events, markets have become extremely volatile and uncertain. Stock and index prices began to fluctuate and some of them reached record lows. What was the real and long-term impact on the mechanisms of financial markets, the aim is to show in this paper. For this purpose, the concept of the market itself, risks and regulations will be explained in the beginning of the paper. In order to assess the impact of coronavirus on financial markets, the paper looked at movements in stock market indices, market capitalization and business volume before and after the pandemic. It also elaborates in detail what measures and policies the central bank and government have used to combat the effects of the virus. The key conclusion of the paper is that the pandemic had a significantly smaller negative impact on the markets than anticipated, and the paper offer several reflections on why the outcome was much better.

Keywords: Global financial markets, Covid-19 outbreak, financial stability, financial market indicators

Table of Contents

1. INTRODUCTION

1.1. The aim of the paper

The aim of this paper is to provide in detail the consequences and impact of the Covid-19 pandemic on financial markets. Covid19 has caused one of the biggest upheavals on the global political, health and financial scene. Because of its prevalence and importance across economies around the world, the coronavirus is one of the biggest exogenous shocks the global financial markets have encountered so far. Due to its unpredictability and initial unpreparedness of governments all global financial markets have been under complete uncertainty in the first few months since the start of the pandemic. To prevent the pandemic from progressing and its effects, governments have introduced measures such as lockdown that have greatly reduced and limited economic activity, resulting in some major market changes. To avoid extremely far-reaching consequences for world economies and financial markets, all firms around the world, and especially large financial institutions, needed to be reorganized and repositioned together with regulatory changes and measures adopted by governments to facilitate and ensure financial intermediation and sufficient resources for the real economy. Many firms encountered funding and liquidity problems because banks and financial intermediaries were reluctant to borrow money lightly due to the uncertainty of the situation. But despite all the negative factors, global financial markets are much more resilient and in better positioning in terms of financing and surviving the crisis due to the fact that G20 governments adopted useful regulatory measures after the global financial crisis that occurred in 2008. Central banks were and still are responsible for financial and monetary security and as such, in agreement with the government, have adopted measures that encourage financial intermediaries to lend money and credit various companies. The common goal of all measures, as well as the fiscal and monetary policy pursued by the government and the central bank, is to mitigate the consequences caused by the coronavirus and to recover the economies and financial markets as quickly and sustainably as possible. This paper will analyze the economic consequences of the pandemic, how individual governments and institutions reacted, how the consequences of the pandemic were reflected in global markets and whether they are better or worse than expected.

1.2. Methodolgy

The purpose of the paper is to present the effects of covid on financial markets and to show how these effects have affected financial stability. This will be done by investigating how individual stock market indicators changed during the pandemic and comparing this situation with previous similar shocks and reactions to them. For the purposes of this paper, resources from international and some Croatian publishers were used. Professional and scientific articles, graphs, tables and statistical data are included under these resources. Also, other specific reliable sites on internet or materials provided by the faculty teaching were used as the resources for the purpose of this paper.

1.3. Structure of the paper

This work is divided into 6 chapters. In the beginning, we will explain in theory what financial markets are, their historical trends, how important they are in practice and what indicators are important for measuring stability. After an introduction on financial markets, we will briefly explain the origin of the pandemic and its movement and compare it with a similar exogenous schock throughout history. We will also explain how systematic risk is managed and what macrprudential regulations have been enacted during such crises.

We will then show how Covid-19 affected market stability using stock market indicators and we will look at why the pandemic did not have as significant an impact as expected. We will historically review the Zagreb Stock Exchange ant its current state, and determine the effects of covid-19. At the end of the paper, conclusion with our toughts and subjective view will be provided as an contribution to the research.

2. GENERAL OVERVIEW OF FINANCIAL MARKETS

2.1. Definitions and characteristics of financial market

In general, „financial markets are markets in which funds are transferred from people who have an excess of available funds to people who have a shortage. Financial markets, such as bond and stock markets, are crucial to promoting greater economic efficiency by channeling funds from people who do not have a productive use for them to those who do.“ (Mishkin and Eakins, 2011). Financial markets can be classified as primary (direct) and secondary (indirect) markets. The primary market deals with new financial claims or securities, whereas the secondary market deals with securities that have already been issued. As a result, primary markets mobilize savings and supply extra capital to the market, while secondary markets indirectly contribute to the supply of fresh capital by rendering securities issued on direct markets. Following the previous logic, there are two types of securities in financial markets: primary and secondary. Also, financial markets can be clasiffied by money and capital markets. The basic difference between these two types is in the period of maturity of financial assets issued. Generally, money markets deal in the short-term (maturity less than 1 year) claims, while capital markets deal in the long-term claims (maturity more than 1 year). Examples of money market are treasury and commercial bills market, while stock markets, government bonds markets, debt markets and derivative markets are example of capital markets. (Bhole, 2004). Debt markets, also known as the bond market, are crucial to the economic activity because they allow businesses and governments to borrow money to fund their operations; they are also where interest rates are set. The cost of borrowing or the price paid for the rental of money is referred to as an interest rate which is where important for all market participants. The stock market, where businesses' stocks are traded, is the most extensively observed financial market in nearly every country that has one; it is commonly referred to simply as "the market." Because funds are frequently transferred from one country to another, the currency of origin must be converted to the currency of the destination country. Foreign exchange markets are place where these funds are converted and where foreign exchange rate is determined. (Mishkin and Eakins, 2011).

Besides all these types of securities and currencies that are traded on different types of market, there are commodities markets where traders deal with natural resources or several types of commodities. Because the price of such resources is unpredictable, a separate market has been developed for them. There is a commodities futures market where the price of goods to be delivered at a future date is already known and agreed upon today. (CFA, 2021)

Market participants are mainly investors and traders, market makers and dealers, independent third parties who arrange trades between buyers and sellers without taking a position in the stock and earning commision for their services. Based on the goal and preferences investors can be speculators, hedgers and arbitrageurs. „Individuals gain access to the financial markets indirectly by transacting with financial intermediraies, such as commercial banks or mutual funfd, or through retail channels with investment banking firms.“ (Kidwell, Blacwell, Sias, Whidbee, 2016).

Two important factors that drive financial market are volatility and risk. Due to a number of endogenous and exogenous factors that can cause instability, the market is extremely volatile and prone to shocks therefore requires a rapid and timely response. When trading in financial markets, risk is always present and should always be taken into account in each new step in trading. Two major categories of risks are market or systematic risk and specific or unsystematic risk. Market risk is the risk which can not be eliminated through diversification and sources of market risk are events such as political turmoil, recession, natural disaster or terroristic attacks. Systemic risk influences entire market at the same time, but we will elaborate a little bit more on systemic risk in the next chapter. Unsystemic risk, on the other hand, is peculiar to a particular firm or industry. Unsystemic risk, can be minimized in an investment portfolio via diversification. Volatility and risk should not be never confused as synonyms in financial markets. Risk is the probability or chance that the value of an investment portfolio will decrease in the foreseeable future, while volatility describes how much individual assets could fluctuate in the market in a given period. „The volatility of the main financial prices - main exchange rates, main interest rate futures, main stock indexes - is often understood or perceived as a measure of risk. Volatility is indeed one of the most important risk indicators that is available to market participants and market observers.“ (ECB, 2020).

When a stock is very volatile, it means that in the foreseeable future its price can fluctuate greatly from extremely low to unusually high price. Exactly the opposite, a stock that is less volatile has a value that does not vary substantially. Any accompanying price change is spread out over a time span at a constant pace.

Other factors and indictaors of financial stability are market indices and market capitalisations by which one can see what are the trends of the market by examining movement of certain indices through period of time and by looking at the overall value of market capitalisations which will determine whether the activity and expectations are high or low. There are many indicators that process the historical movements of various indices, prices and capitalization and on that basis draw conclusions about a particular stock, market or sector.

It is important to note that financial markets are also subject to market failures such as asymmetric information, moral hazard and adverse selection. Regarding moral hazard, banks are experts at originating loans and establishing a borrower's creditworthiness. To establish a prospective borrower's creditworthiness, banks have created sophisticated credit-scoring models. After the consumer completes the credit application, the information is scanned into the bank database, and the credit risk profile is shown after a few seconds. Banks can decide whether or not to grant a loan based on this credit profile, considerably reducing the costs of adverse selection. Moral hazard issues, on the other hand, develop after the money has been lent. Business loan contracts, which are detailed agreements designed to incentivise borrowers to behave in accordance with loan terms, may include a variety of performance measurements, as well as rewards and penalties based on the firm's performance over time. For example, if a company's financial ratios outperform over time, the bank may raise the loan rate. Banks might also prohibit particular assets or demand that expenses be cut by a certain percentage by a certain date. (Kidwell, Blacwell, Sias, Whidbee, 2016).

In the chapter where we will deal with the impact of pandemics on financial markets, we will look at index, capitalization and volatility movements in order to find out what consequences the virus left on the market by comparing it with the times before the crisis. In addition to the aforementioned market indicators of the current state, important indicators of stability are some economic factors such as inflation, GDP and labor market data.

2.2. Historical movement of financial markets

Comparing global markets today and a few decades ago, there is a clear difference in the size and technology that drives and connects markets and the world. Especially because of this size and technology that enables fast connectivity and data processing, today more than ever it is necessary to react in a timely manner and assess volatility in order to make the right regulations that will enable efficient operation. Financial markets have existed for almost more than 400 years and over time have developed into one of the most important means for the functioning of the economy. Financial markets began to gain increasing importance at the beginning of the 20th century when many businessmen decided to raise funds by issuing shares and trading in various capital markets. For the purpose of reviewing the historical movement of financial markets, we will make a brief overview of the most important market milestones.

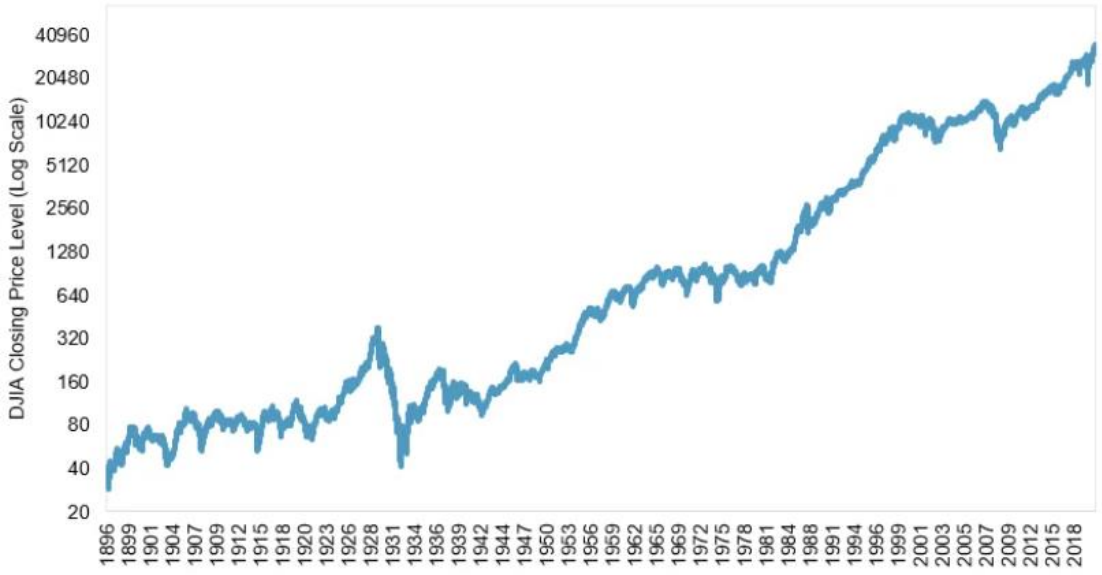
In 1929, one of the most notable stock market crashes occurred. The economy of the United States declined by more than 36% from 1929 to 1933, as measured by Gross Domestic Product (GDP). Many American banks collapsed, causing consumers to lose their funds, while the unemployment rate soared to almost 25% as workers lost their jobs. At that time, people were buying shares because their prices were rising and people thought they would make money so easily, and there was no real basis for that. For example, the stock market peaked on Sept. 3, 1929, with the Dow reaching 381.17, just before the crash, which wiped out both corporate and individual riches. The Dow hit its all-time low on July 8, 1932, when it closed at 41.22. The Dow Jones Industrial Average lost 89.2 percent from peak to trough. On the Figure 1 we can see that largest drops and smallest price levels of indices happened in 1929. Also, on the Figure 2 we can see that the second largest day-drop of 12,9% S&P 500 experienced in 1929.

One of the biggest crises in the financial markets occurred in 1987. On Monday, October 19, 1987, the Dow Jones Industrial Average dropped 22.6 percent. The drop followed the announcement by the federal government of a larger-than-expected trade imbalance. The dip was preceded by a 44 percent surge in the Dow Jones' value in the first half of the year, the greatest since the Great Depression as we can see on the Figure 1. Also, S&P 500 experienced largest day-drop in 1987 and it accounted for 20,5% as we can see on the Figure 2.

The abrupt decline sent stock exchanges throughout the world into a tumble, demonstrating how interconnected modern economies have grown as a result of globalization. One of the leading reasons for the collapse was the large appearance of international investors who invested in risky derivatives and options.

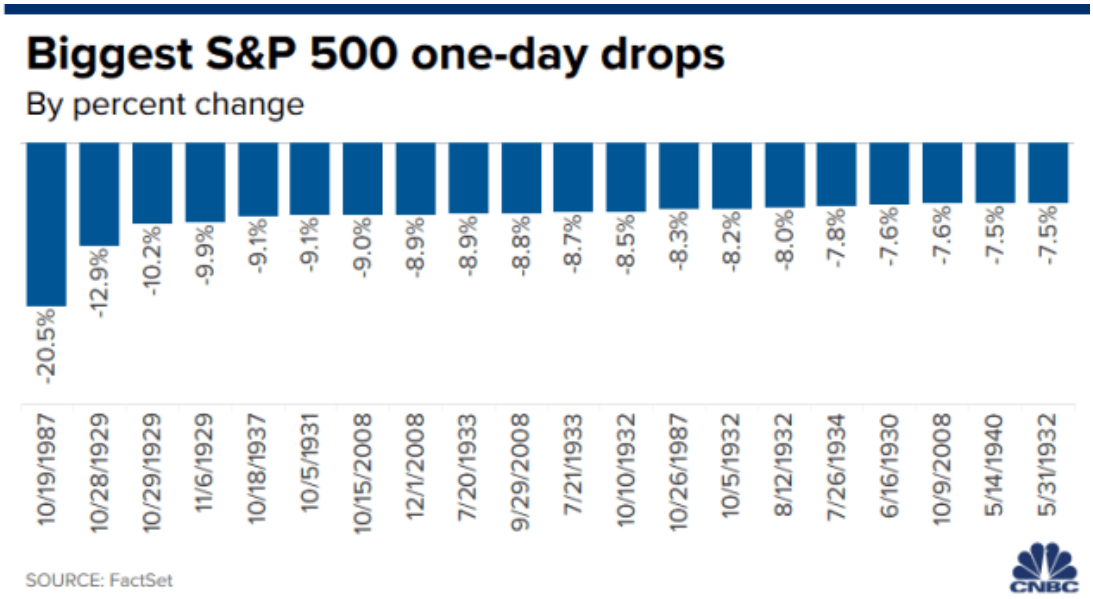
The global financial crisis was an important turning point in the financial markets when the stock market crashed due to the issuance of treasury loans to subprime clients who often overburdened their mortgages and managed to obtain a loan without downpayment and with very little documentation. Precisely because of this crisis, which brought huge consequences to the wider world, the era of low interest rates in the money market and the era of stricter microprudential regulation of financial institutions that prevented investment in risky derivatives. On the Figures 1 and 2 we can see that global financial crises caused one of the greatest single day drops for S&P 500 and average big drop of DJIA.

Figure 1 DJIA Index Levels in last 125 years



Source: Yahoo finance. (2021). The 5 craziest moments in Dow's 125-year history. Retreived September 16, 2021, from https://finance.yahoo.com/news/the-5-craziest-moments-in-dows-125-year-history-182908357.html

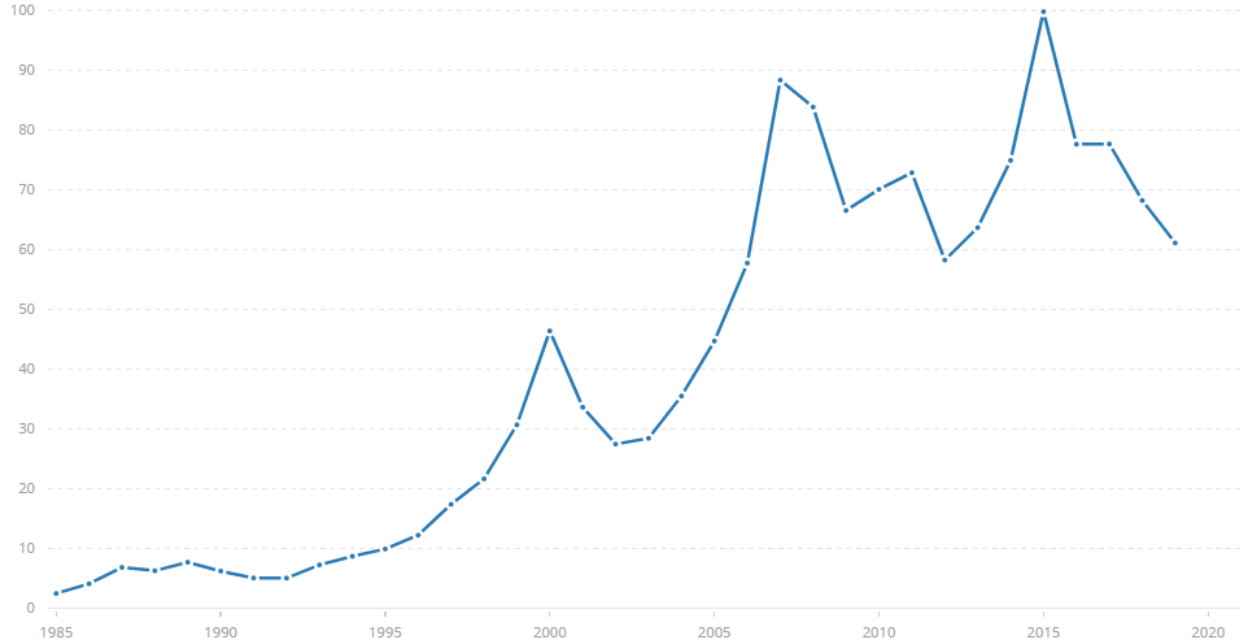
Figure 2 Biggest S&P 500 one-day drops



Source: CNBC. (2021). Dow sinks 2,000 points in worst day since 2008, S&P 500 drops more than 7%. Retrieved September 8, 2021, from https://www.cnbc.com/2020/03/08/dow-futures-drop-700-points-as-all-out-oil-price-war-adds-to-coronavirus-stress.html?__source=twitter%7Cmain

With the growth of turnover and the size of major world stock exchanges such as the NYSE, NASDAQ, Tokyo and London Stock Exchanges, the prices of the index and market capitalization grew. Capital controls were abolished in the 1980s, allowing capital to flow freely across countries once more. In the United States and other areas of the globe, information technology and biotechnology have become the most important sectors contributing to globalization and connecting the world by enabling the growing volume and growth of stock exchanges. Money poured into technology businesses in the 1990s, and at the peak of the technology stock bubble in 1999, worldwide equities capitalization surpassed global GDP for the first time in history. As we can see on the Figure 3, from 1985 until today the volume of traded stocks has grown rapidly which proves the significant development of financial markets in the last 30 years. Compared to 1990 levels, the volume of stock market operations has increased even more than tenfold, which is enough to show how strongly and quickly markets began to develop with globalization

Figure 3 Stocks traded from 1985-2020, total value (current $)



Source: The World Bank. (2021). Stocks traded, total value. Retrieved September 8, 2021, from https://data.worldbank.org/indicator/CM.MKT.TRAD.CD?end=2020&most_recent_year_desc=true&start=1985&view=chart

2.3. Current state of the financial markets

Given the shocks caused by the coronavirus and the uncertain economic and political situation, the market is in pretty good state this year in terms of index, capitalization and volume. Particularly by looking at the indices, the S&P 500 reached record highs last week for the 52nd time from the beginning of the year, especially due to encouraging statements by the Fed president that allayed concerns about a possible tightening of monetary policy. Together with the positive messages regarding monetary policy, the inflation rate, which is now 2 percent, is an important factor to which we can thank the currently record prices of the index.

The Dow Jones index jumped 0.9 percent to 35,455 points last week, the S&P 500 index by 1.5 percent to 4,509 points, and the tech Nasdaq by 2.8 percent to 15,129 points. The S&P 500, Dow Jones Industrial Average and NASDAQ Composite index have actually risen gradually throughout the year, often reaching record highs with occasional declines in response to the pandemic situation and some other geopolitical developments. Last week, European stock markets made a profit, with the Stoxx 600 index rising 0.8 percent to 472.34 points. The Frankfurt DAX rose 0.27 percent to 15,851 points, the London Ftse 0.86 percent to 7,148 points, and the Paris CAC 0.83 percent to 6,681 points at the same time. On the Tokyo Stock Exchange, the Nikkei index fell 0.64 percent last week, to 27,641 points. We can conclude that the current trend is moderate index growth on most major stock exchanges around the world. Also, this year we witnessed a record high ratio of the market value of stock exchanges and US GDP when the market value of shares was as high as 207% of current GDP. Three largest stock exchanges in the world currently have high market capitalization. For example, NASDAQ and Shangai Stock exchange almost doubled their value compared to the 2019 and that is reason why we are currently witnessing record high ratio of market cap to GDP. Likewise, according to Statista's estimates, this year's total financial market business volume is roughly 15% higher compared to last year's when the total volume was $ 62 trillion.

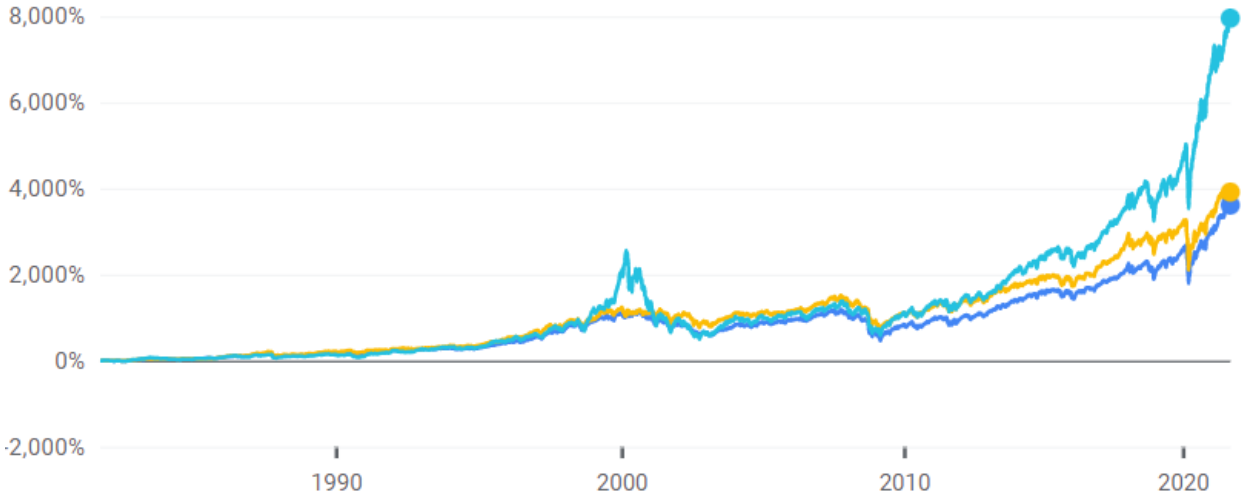
A bull market is a situation in which prices rise continuously over a period of time or are expected to rise. The commonly accepted definition of a bull market is when stock prices rise by 20% after two declines of 20% each. A general reduction in prices of more than 20% has been felt since March 2020 after the introduction of the measures against Covid-19. Epidemiological measures that caused negative opinions on the stock market contributed to the emergence of the bear market during the beginning of the pandemic. From August last year until now, prices have risen, so the current market is bullish. According to current indicators, taking into account easing measures and some encouraging studies, we can say that investor confidece will grow and the bull market will continue.

Figure 4 Effective federal fund rates in last 65 years

Source: Board of Governors of the Federal Reserve System. (2021). Retrieved September 8, 2021, from https://fred.stlouisfed.org/

As we see in the Figure 4, we are currently witnessing historically low money market interest rates. We can see that the last 10 years is historically the longest period of low interest rates, and such low interest rates are a consequence of central bank regulation after the 2008 global crisis. Currently, interest rates are 0% -0.25% and historically good results in financial markets can be attributed to extremely low interest rates and partuclarly message from the Fed president about monetary. Similar situations in money markets are in other parts of the world. With such low interest rates, the National Banks have provided companies with a high level of security for more financed and investment in various projects.

Figure 5 S&P 500 (blue line), DJIA (yellow line) and NASDAQ (light blue line) growth rates last 20 years



Source: Google Finance. (2021). Retrieved septmeber 8, 2021, from https://www.google.com/finance/quote/.INX:INDEXSP?sa=X&ved=2ahUKEwj-uJTXovDyAhXkwosKHT7VBWwQ_AUoAXoECAEQAw&window=MAX&comparison=INDEXDJX%3A.DJI%2CINDEXNASDAQ%3A.IXIC

Based on the Figure 5, we can conclude that in the last 20 years, stock market indices have been growing continuously, with particularly significant growth occurring after the 2008 financial crisis. The light blue line shows the extremely high growth of the NASDAQ index, the yellow line shows the growth of the DJIA index, and the dark blue the growth of the S&P 500. The previously presented historically low level of interest rates, good regulation as well as the general increase of the market due to the emergence of new investors through online free platforms have enabled such a large and continuous growth.

3. GENERAL OVERVIEW OF COVID-19

3.1. The onset of pandemic

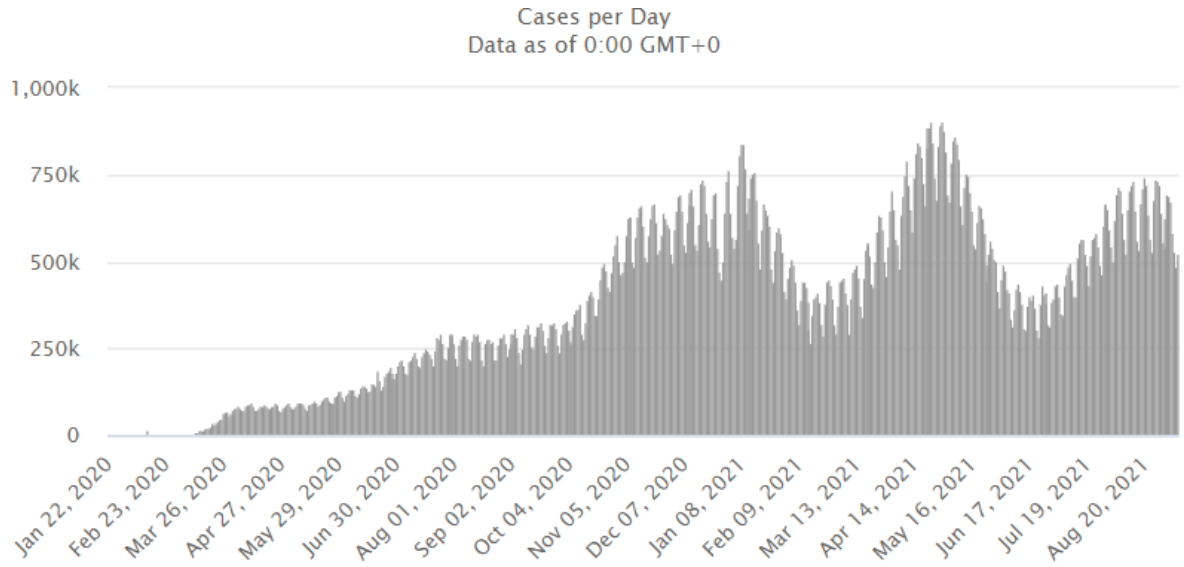
The new coronavirus was discovered at the end of 2019 in China. It is a new strain of virus that has never been transmitted to humans before and the name of the disease they cause is called Covid-19. According to previous case analyzes, COVID-19 infection in about 80% of cases causes mild disease (without pneumonia or mild pneumonia) and most patients recover, 14% have severe disease, and 6% have severe disease, but despite the fact that most people are recovering, the virus is extremely dangerous and poses a major global threat and problem. The initial public opinion was that the virus would not spread outside China, which is why the situation around the coronavirus and what was happening in China was quite relaxed in Western countries.

At first, Europe was "deprived" of cases of coronavirus infection and did not pay much attention to it, but after the first few cases of infection outside China in late January 2020, there is a serious concern of the government about the potential threat. Due to the pervasive connection between the world and globalization, it was inevitable that the virus would spread around the world, bearing in mind that the virus is extremely easily transmitted in any kind of close physical contact. From the appearance of the first case outside China to the complete lockdown, everything happened quite quickly, so it also greatly affected the unpreparedness of the public and the economy. Because of its ease and mode of transmission, the coronavirus soon caused a major shock to the world economy as many activities could not take place in a situation where it was forbidden to leave homes, let alone cities or states. The next section will present the progression of the virus and the epidemiological measures adopted in response to the pandemic.

3.2. Development of the coronavirus and epidemiological measures taken

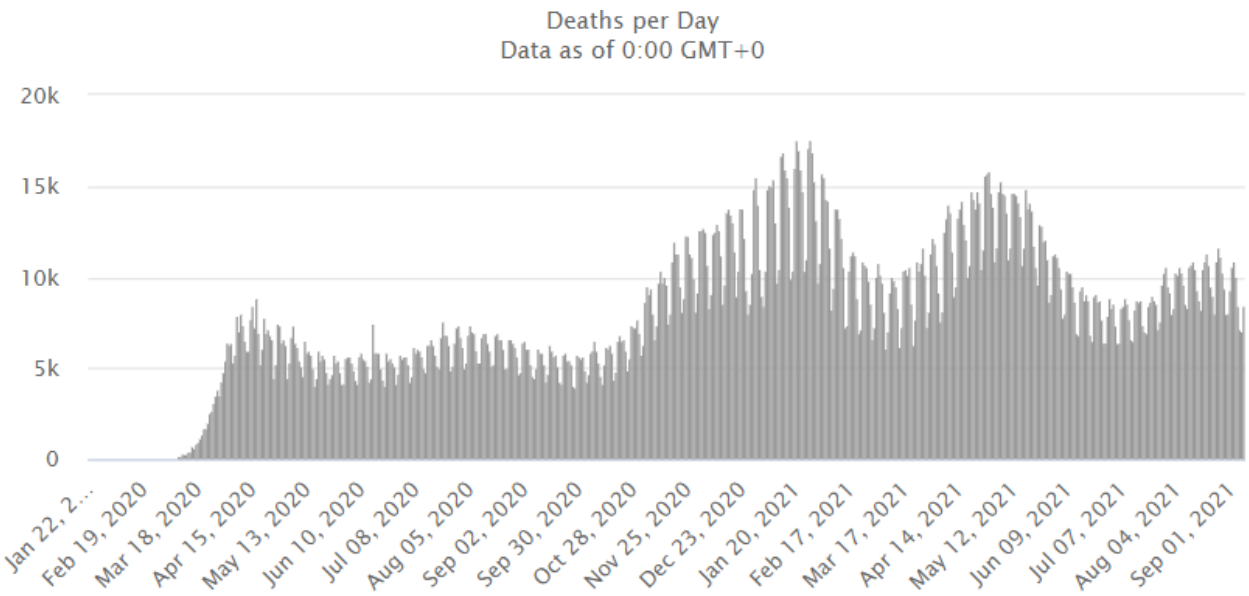
The corona virus began to grow enormously fast and spread around the world in early March when people with symptoms began to be tested more often and after greater interest from the ruling. Soon, most countries closed their borders due to the extremely high growth of cases, and in some countries the growth was even exponential. Because of this, the virus soon became the greatest threat to all countries of the world. Many states had a very large number of deaths, and the pandemic did not abate, but more and more new cases were counted daily. It has long been expected that the number of cases will start to fall, and this happened during the summer when the weather conditions are not the best for the spread of the virus. Despite a significant drop in the number of cases during the summer, the virus continued to spread firmly with the return of colder weather and more frequent use of indoor spaces. According to Figure 6, we can see that daily cases began to rise sharply in late 2020 with a significant decline in January 2021 to April 2021. The increase was again felt in early May, but in mid-July the number of patients decreases. The sharp increase in the number of patients after the summer of 2020 was due to the gradual easing of measures and the growing number of people tested. Likewise, we can observe that the number of deaths increased (Figure 7) in periods when the number of cases also increased, but mortality did not increase. Mortality was falling due to the fact that the number of deaths did not grow at high rates as the number of infected persons.

Figure 6 Daily new cases from January 2020 to August 2021



Source: Worldometer. (2021). Retrieved September 8, 2021, from https://www.worldometers.info/coronavirus/

Figure 7 Daily new deaths between January 2020 and August 2021

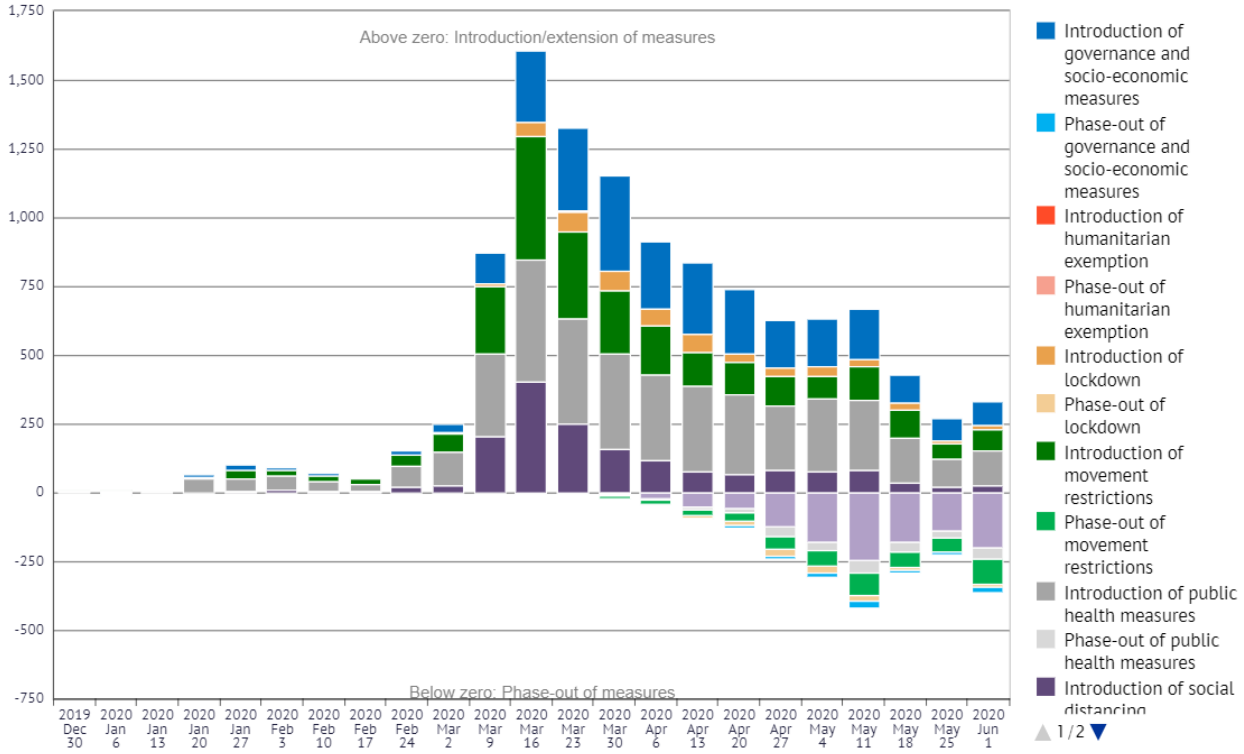


Source: Source: Worldometer. (2021). Retrieved September 8, 2021, from https://www.worldometers.info/coronavirus/

According to the latest data, 223,243,391 people have been infected worldwide and 4,607,523 have died. Currently, many people have been vaccinated and the vaccination venture is being carried out extensively around the world. In general, the virus is currently less dangerous because of vaccine therefore a large number of those infected is not so high concern anymore, but it seems that the end of the pandemic and the return to the old normal is still not in sight.

Due to the rapid progression of the virus we have outlined above, many governments around the world have opted for radical epidemiological measures to halt the spread of the virus. As we can see on the Figure 8, in March 2020 more than 1,500 epidemiological measures were implemented worldwide. Most European and world countries opted for a complete lockdown in which all service activities were closed and work was allowed only to businesses that sold products for necessary human needs. All educational institutions were closed and switched to so-called online fashion. Many states have introduced rigorous measures at the borders, banning all travel except some necessary ones. The transport of goods was extremely slow and difficult due to all the strict rules at the borders and at the customs. Measures came into force stipulating that every person must have a mask on their head when entering any closed facility, and in some countries they even had to walk on the street with a mask. Curfews were introduced around the world and people were forbidden to leave their places of residence and many states banned their citizens from moving between cities and countries. This cataclysmic state lasted until the beginning of June and the summer days. During and after the summer extreme measures of ban on movement and curfew were gradually lifted as we can see on the Figure 8, but strict measures were still in force when it came to catering facilities and all other facilities where it was possible to get close contact. Travels or visits to catering units continued to take place under strict rules, which greatly hindered the normal functioning of individual sectors. The situation with the measures began to improve further after the vaccine was invented and vaccination started. In many countries the measures are relaxed and it is easier to travel and perform daily duties, but all this is possible with vaccination certificates and the presentation of a negative antigen test. The current situation compared to the onset of the pandemic is excellent, mostly thanks to vaccination and good control of the spread of the virus.

Figure 8 Introduction vs Phase-out of pandemic measures by category worldwide



Source: Knoema. (2021). Governments are phasing-out COVID-19 measures. Retrieved September 9, 2021, from https://knoema.com/kosfrke/governments-are-phasing-out-covid-19-measures-were-the-measures-effective?Region=US

3.3. Historical consequences of such exogenous shocks on global financial markets

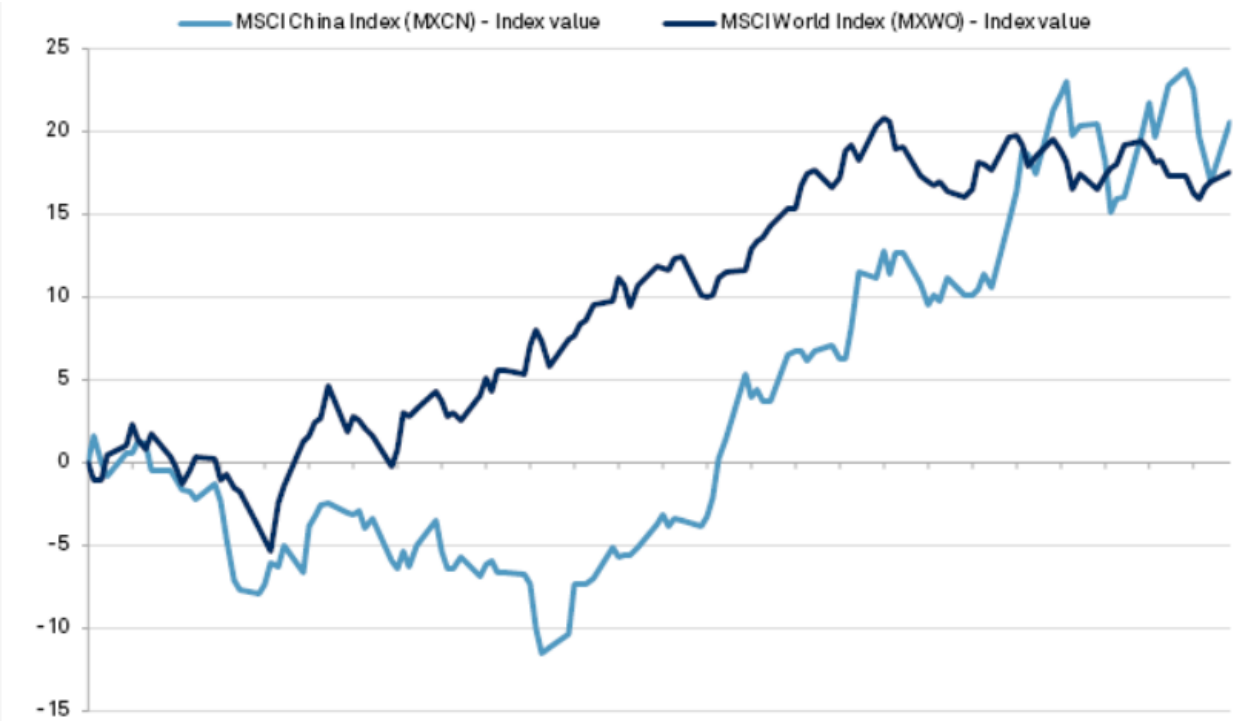
Financial markets have on several occasions already faced similar exogenous shocks that have caused unforeseen events and instability. Some events had a smaller, some events had a greater impact on markets and the economy. On the basis of Sars 2003, the Spanish flu and Ebola, we will show how the market reacted and what the consequences were and to what extent.

SARS-associated coronavirus is a coronavirus that causes a viral respiratory disease known as severe acute respiratory syndrome (SARS). In February 2003, SARS was first detected in Asia.

Before the SARS worldwide epidemic of 2003 was contained, the sickness expanded to more than two dozen nations in North America, South America, Europe, and Asia during the following few months. During the 2003 SARS outbreak, a total of 8,098 individuals were infected, according to the World Health Organization and 774 of them died. The SARS virus caused uncertainty in the market and a lot of negative, but short-term changes that recovered quickly. Since the advent of the virus, China's MSCI[1] index has lagged behind global rivals when MSCI index fell more by 10%, but it has recovered to the ground in just six months as we can see on Figure 9. Particularly affected was China where the cumulative index of idyosyncratic returns fell 3 months in a row by 8%, but recovered fairly quickly. At that time, trailing earnings for exposed industries like hotels and restaurants fell by more than 8% in China, but it recovered within few quarters. Other developed countries of the world, such as the USA and the eurozone countries, felt the short-term consequences, which were recovered in a very short time as we can see movement of the global MSCI index on Figure 9. During the SARS pandemic, all 11 S&P 500 sectors fell, with information technology, financials, and communication services dropping by 14 percent, 16 percent, and 26 percent, respectively. But in the period of 12 months after the appearance of the virus, S&P grew significantly, by 20%. Analyzing the impact of SARS in 2003, we should take into account that the China's GDP was 4% of global GDP, now it is 17%. Likewise SARS was much less widespread and counted incomparably fewer cases than Covid-19 and this is an essential factor when looking at its impact on the economy.

[1] "The MSCI Indexes are a measurement of stock market performance in a particular area. Like other indexes, such as the Dow Jones Averages or the S&P 500, it tracks the performance of the stocks included in the index." (The Balance, 2020)

Figure 9 MSCI China and MSCI World Index during SARS outbreak



Source: S&P Global Market Intelligence. (2021). Economic impact of coronavirus likely to be small, SARS data suggests. Retrieved September 8, 2020, from https://www.spglobal.com/marketintelligence/en/news-insights/trending/0iOhfNVk3-CuD6GHP5BklQ2

The Spanish flu pandemic killed between 50 and 100 million individuals throughout the world. The H1N1 avian flu subtype was the source of this virus. In March 1918, the Spanish flu pandemic began and lasted until June 1920. It covered the entire globe. Because of its similarity to Covid-19 in terms of large numbers of cases and rapid spread, Spanish flu is a good comparison. In the case of Spanish flu, virus and large deaths amounts had an impact on the global economy and caused the Dow Jones Industrial Average to drop almost 11% in four months as we can see on the Figure 10. But in the case of the Spanish flu, due to the overlap of World War I and the pandemic, it is difficult to discern what the impact of the pandemic was and how much of the war. The virus and the war inflicted a seven-percentage-point drop in real stock returns in the United States, as well as a 3.5-percentage-point drop in returns on short-term government debt. Meanwhile, both War and pandemic increased inflation in the United States by five percentage points.

Still, economists believe the impact of the Spanish flu was much smaller than the impact of the war, especially since stock markets were in very little decline during the three waves of the pandemic by looking at the level of the Dow Jones Industrial Average on the Figure 10. It is encouraging that the market grew rapidly as we can see on the Figure 10, although again it is difficult to establish what was the real reason for such growth.

Figure 10 DJIA Index growth rate and Deaths rate during Spanish Flu

Source: MarketWatch. (2020). What will the stock market look like in a post-coronavirus world? The bulls are hoping history repeats itself. Retrieved September 8, 2021, from https://www.marketwatch.com/story/what-will-the-stock-market-look-like-in-a-post-coronavirus-world-the-bulls-are-hoping-history-repeats-itself-2020-04-19

The Ebola epidemic in West Africa caused 11,310 deaths in Guinea, Liberia, and Sierra Leone, and 15 deaths outside of these three countries. Over the course of Ebola, the S & P500 fell 6% over a 3-month period when it became the biggest elderly of the threat. The sectors most hurt by the epidemic were airlines, cruises, and hotels. In October 2014, shares of American Airlines and Delta Air Lines both fell 20% when word broke that an Ebola patient had flown the day before being diagnosed. During one month during Ebola, the Cboe Volatility Index jumped above 90% due to the proverbial volatility of the market at the time. It is difficult to conclude how much the jump in instability is the result of Ebola itself.

At the time, other negative events such as the economic downturn in Europe, an energy price meltdown, and the fairly large progress and growth of the Islamic State in Iraq played an important role in the growth of volatility. Despite this, several stocks witnessed huge increases at the time. As it worked on an experimental Ebola treatment, Tekmira Pharmaceuticals saw its shares rise 200 percent in 2014. It is also important to note that the declines caused by Ebola itself returned to previous levels in a very short time, just as was the case with both SARS and the Spanish flu.

3.4. Systemic risk and macroprudential regulations during such crisis

"Systemic risk refers to the risk of a breakdown of an entire system rather than simply the failure of individual parts. Often the cause of risk is exogenous, meaning outside the financial system." (CFA Institute, 2020). According to (Krišto, Stojanović and Filipović, 2015) "Recent financial crisis and its dramatical consequences have only highlighted systemic risk as an essential risk exposure of traditional and contemporary financial institutions and markets. It therefore understands that the issue of managing and measuring systemic risk is one of key interests for scientific, expert, regulatory and practical development." The main goal of regulators and policymakers is to limit that risk and bring it under control when an unexpected crisis occurs. The importance of systemic risk management and control is especially important when a particular crisis for more than two months adversely affects the economy and markets in a way that financial instability is so great that significant economic losses occur along with the impossibility of economic growth and declining welfare. One can distinguish between a "horizontal" perspective of systemic risk, where attention is confined to the financial system, and a "vertical" perspective of systemic risk in which the two- sided interaction between the financial system and the economy at large is taken into account. (ECB, 2009)

In order to reduce the division of different triggers and to simplify things, there are three types of risks: the contagion risk, the risk of macro shocks causing simultaneous problems and the risk of the unravelling of imbalances that have built up over time. Contagion risk is actually a situation in which financial troubles at one or more banks have a cascading effect on a large number of other banks or the whole financial system and thus can lead to the collapse of another bank, regardless of the fact that it may have had a satisfactory situation and was solvent.

As the name itself suggests, the second mentioned dimension of risk is related to macroeconomic downfall or to exogenous risk, which negatively affects banks and other financial intermediaries when their vulnerability to macroeconomic and exogenous shocks is expressed due to the fact that credit risk is growing. The third dimension of risk is caused by endogenous shocks and the emergence of irregularities and imbalances in financial systems and the best example of this is the lending boom. (ECB, 2009). Behind all these risks are various versions of imbalances such as asymmetric information, incomplete markets, externalities, etc. and it is such irregularities that are particularly vulnerable to the financial system due to the high dependence on timely information and due to the high degree of interconnectedness and interdependence of the entire financial system and all active participants of the system.

"Macroprudential regulation is a comprehensive policy with the goal of safeguarding financial stability. The macroprudential approach was seen as having two dimensions. The first one is risk development over time, with special reference to the issue of procyclicality of the financial system and the second one, risk distribution within the financial system, also known as the cross-sectoral dimension." (Krišto and Stojanović, 2013). Simplified, macroprudential policies are financial policies aimed to ensure the stability of the financial system as a whole in order to prevent significant irregularities in credit and other important financial services necessary for sustainable and stable economic growth. "Financial stability is a condition in which an economy's mechanisms for pricing, allocating, and managing financial risks (credit, liquidity, counterparty, market, etc.) are functioning well enough to contribute to the performance of the economy." (Schinasi, 2004). This financial stability is extremely vulnerable during the aforementioned shocks and therefore macroprudential policies aim to significantly reduce and control the buildup of these vulnerabilities in the whole system. On the other hand, microprudential policies focuses more on the individual institutions and relying only on microprudential policies can in fact make whole financial system less stable because it does not observe whole market. Therefore, macroprudential policies are extremely important for the entire financial system. Due to the importance of focusing on the whole system, macroprudential policy cannot be considered in isolation, there are important interconnections between macroprudential, microprudential and monetary policy. In addition, macroprudential policy interacts with banking supervision in order to maintain mutual understanding of the situation in the financial system.

An important crisis and turning point for the financial system occurred in 2008 after the global financial crisis. After this great crisis, regulators decided to intervene more significantly in order to diminish the effects of such shocks on the banking system. The financial crisis has its roots in the housing sector when bee banks accumulate losses on investments in mortgages and similar securities. The biggest reason for this crisis is the change in the regulation of investment banks, which allowed banks to invest clients' money in derivatives. Subprime residential mortgage derivatives were formed, and demand for houses exploded. Subprime mortgage borrowers couldn't afford their mortgages once the Federal Reserve increased interest rates. Borrowers defaulted on their mortgages, and derivatives and other assets related to them lost value. Many companies such as Lehman Brothers, American International Group, CitiGroup and Bear Stearns went bankrupt at the time. The financial crisis is a perfect example of systemic risk and its impact on the economy. The situation in 2008 shows that the collapse of one company, namely Lehman Brothers after the Fed did not want grant them bailout, caused complete confusion in the financial system and the US market, but also in other countries around the world. (Bullard, Neely, and Wheelock, 2009.)

This crisis happened as a clear consequence of a lack of regulation and unscrupulous insurance practices that passed all the risk to investors. After the crisis, there was a logical need for governments, central banks and financial institutions to define clear macroprudential and monetary policies that will limit systemic risk and thus control the occurrence of events that can have a very negative impact on the market and the economy. There are three types of macroprduentual policy instruments: capital-based measures, borrower-based measures and liquidity-based measures. By boosting capital and liquidity buffers, these instruments make the financial systems more stable. Examples include capital buffers for global and other systemically important institutions, the liquidity coverage ratio and the net stable funding ratio. Authorities may also implement borrower-based measures that limit lending at the individual borrower level whenever possible within the legal framework. Macroprudential policies can also be structural and cyclical. Structural policies are put in place to make lenders or borrowers more resilient to adverse occurrences over time, while cyclical policies attempt to increase resilience before an economic downturn in order to reduce the drop in credit supply once the slowdown happen.

An example of a cyclical policy is when banks are required to boost capital cushions during expansion when systemic risk increases and then to decrease them during downfall to absorb losses. (Brookings.edu, 2020)

4. EFFECTS OF COVID-19 ON GLOBAL FINANCIAL MARKETS

4.1. COVID-19 impact on global financial market performance

As mentioned earlier, Covid-19's exogenous shock has affected financial market performance because of its prevalence and because of measures taken to stop the pandemic. The extent of the effects of the pandemic on financial markets will be discussed in this chapter. Looking at the prices of various indices, the general level of prices on stock exchanges and the market capitalization of stock exchanges, we will conclude what impact coronavirus had on the market.

In the midst of measures and the spread of the virus in the first few months since March 2020, volatility in the markets has generally grown due to uncertainty about compliance and the end of the pandemic. Interest rates and equity prices were at record lows along with a large drop in the prices of commodities because trade was greatly restricted by measures. At a time when countries were declaring quarantine and lockdown in March 2020, indices such as the S&P 500, Dow Jones, FTSE and STOXX experienced almost record lows. Over the 2020, several other types of financial markets have witnessed varying pandemic-related outcomes.

For instance, government bond yields fell significantly as the pandemic progressed for the reason that investors sought safer haven for their funds. In addition, various returns were seen in commodities markets, with precious metals outperforming US stocks despite overall commodity prices being negative. Also, the fact that the virus originated in China in some way determined the course of the pandemic and the impact on the markets. Because China plays a large role in global output and trade, economic spillovers from an initial negative shock in China were enhanced globally. The initial market downfall in March revealed the financial vulnerabilities resulting from the conflicts between high corporate debt and poor credit quality.

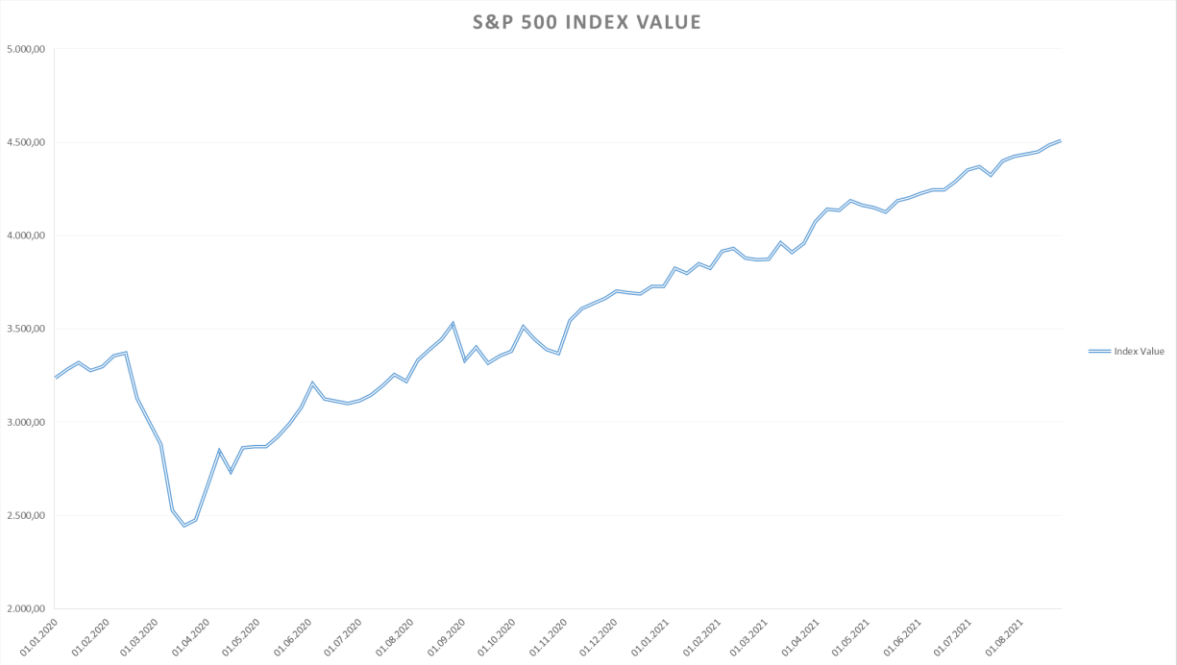
Although all major stock markets reached their lowest point during the COVID-19 financial crisis in March 2020, the recovery has been pretty rapid, but uneven. Some markets like the US already set record highs by the end of the year, while other countries like the U.K. fall below pre-corona virus levels. From the end of last year until now, many indices on the American, European and Asian stock exchanges have reached record amounts.

On the other hand, some tech firms that offered various platforms through which trade, online business, or teaching took place benefited tremendously from the coronavirus because of the lockdown that allowed the rapid growth of certain platforms. For instance, the NASDAQ is home to many of the fastest growing companies in 2020 and that is reason why its market capitalization rose so sharply, what we will see on graphs later. Companies that lost the most value during onset of the pandemic, on the other hand, tended to be in more conventional industries, such as energy and tourism. Given the decline in tourists and transportation during the epidemic, this is not surprising. (Statista, 2021)

4.2. Stock market indices movement during pandemic

To determine the impact of the pandemic on markets, we will look at price movements of the world's most famous indices from the outbreak of the coronavirus to the present. As we can see from the Figure 11, The S&P 500 index fell 12% between March 4 and March 11, 2020, plunging into a bear market. The S&P 500 fell 9.5 percent on March 12, the most in a single day since 1987. The index began to rise in early April and had achieved a new high of 3,849.62.68 on January 20, 2021. The S&P 500 index was at 4,509.37 points on August 25, 2021. After a significant drop in the S&P 500 index, the market soon became a bear because the record closing high on February 19 was 3,386, and three weeks later the S&P 500 was 2,480. The decline was more than 20%, more precisely 26%, which marked the transition to the bear market. Simply put, investors were afraid to buy stocks for fear of a possible economic downturn caused by the pandemic. But as can be seen in Figure 11, the S&P 500 returned at the end of round 2020 due to a better epidemiological picture and the discovery of vaccine, which stimulated positive trends.

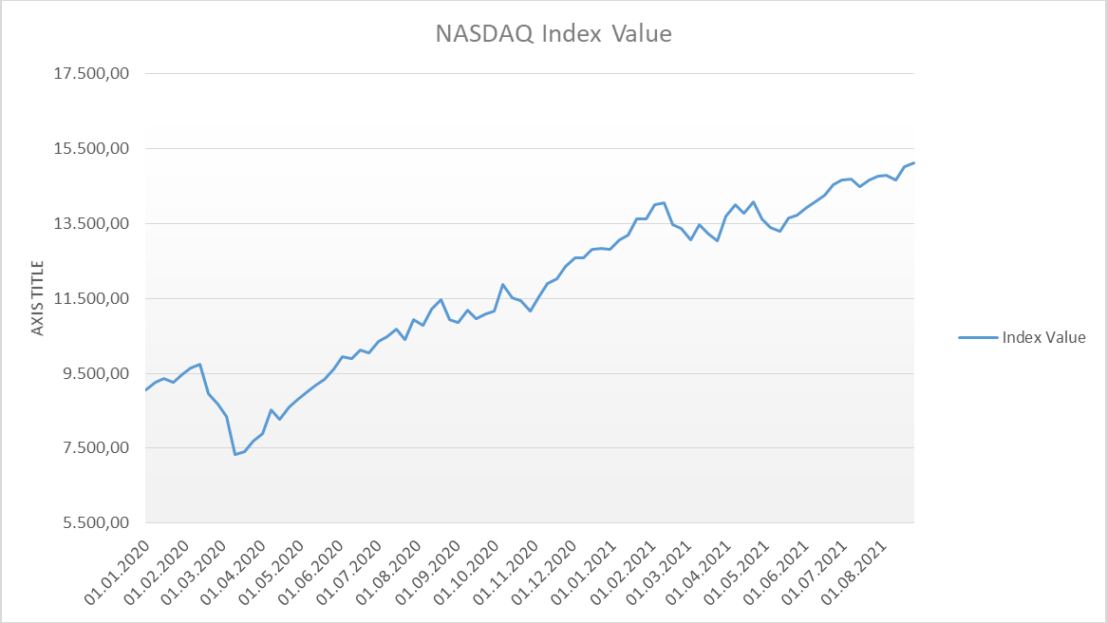
Figure 11 Weekly development of S&P 500 index from January 2020 to August 2021



Source: Statista. (2021). Retrieved August 26, 2021, from https://www.statista.com/statistics/1104270/weekly-sandp-500-index-performance/

For almost the same reasons, there was a big drop in the other two most significant indices, the Dow Jones Industrial Average and the NASDAQ Composite. As we can see from the Figure 12, from February 12 to March 11, 2020, the Nasdaq Composite Index has declined by almost 2,400 points, but since then has been recovered to 15,129.50 points by 25 August 2021. The Nasdaq Composite index reached a little over 9.700 points in February 2020 — right before the worldwide coronavirus (COVID-19) outbreak. The NASDAQ index returned to pre-pandemic levels by the end of May, and the biggest reason for this is that many technology giants listed on the NASDAQ stock market have grown rapidly and profited from the pandemic due to greater use of technology and online platforms during lockdown and quarantine.

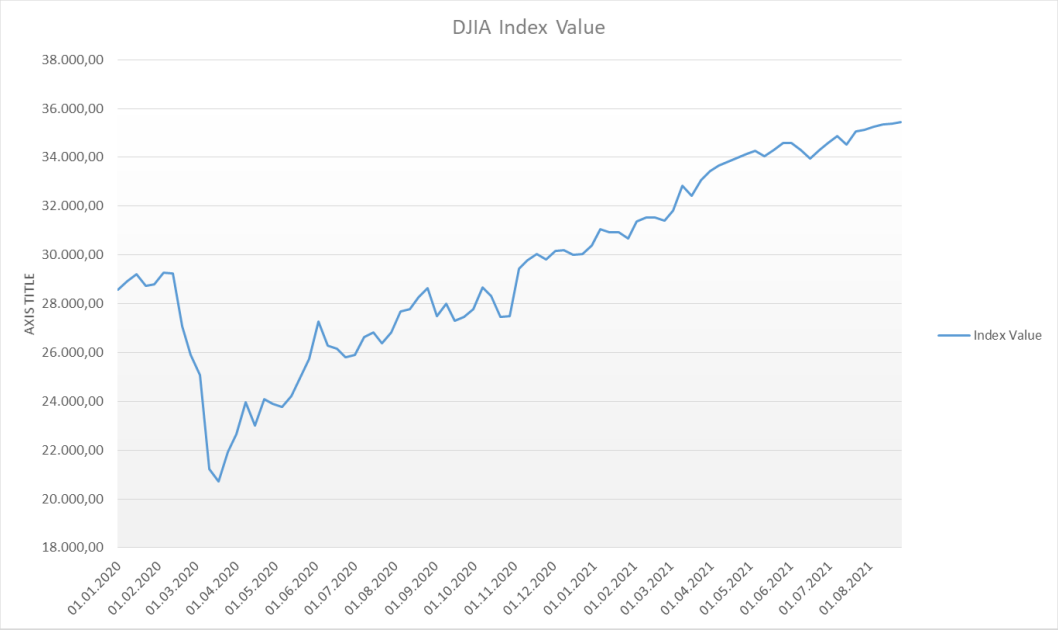
Figure 12 Weekly development of the NASDAQ Composite index from January 2020 to August 2021



Source: Statista. (2021). Retrieved August 26, 2021, from https://www.statista.com/statistics/1104283/weekly-nasdaq-index-performance/

From February 12 to March 11, 2020, the Dow Jones Industrial Average (DJIA) index has decreased to about 8,000 points during the four weeks. But since then to August 25, 2021, it rose to 35,455.80 points. In February 2020 – the DJIA index was at just over 29,000 points immediately before the worldwide coronavirus (COVID-19) epidemic. The Dow Jones Industrial Average fell more than 3,500 points in the week of February 21 to February 28, a loss of 12.4 percent — its biggest weekly percentage loss since October 2008 which shows have volatile market was at the start of the pandemic. But the DJIA followed a relatively quick recovery like the S&P 500 and NASDAQ, so it reached pre-pandemic levels at the end of 2020, and in the last two months of this year it even exceeded the 2019 level as it can be seen on Figure 13.

Figure 13 Weekly development of the DJIA index from January 2020 to August 2021



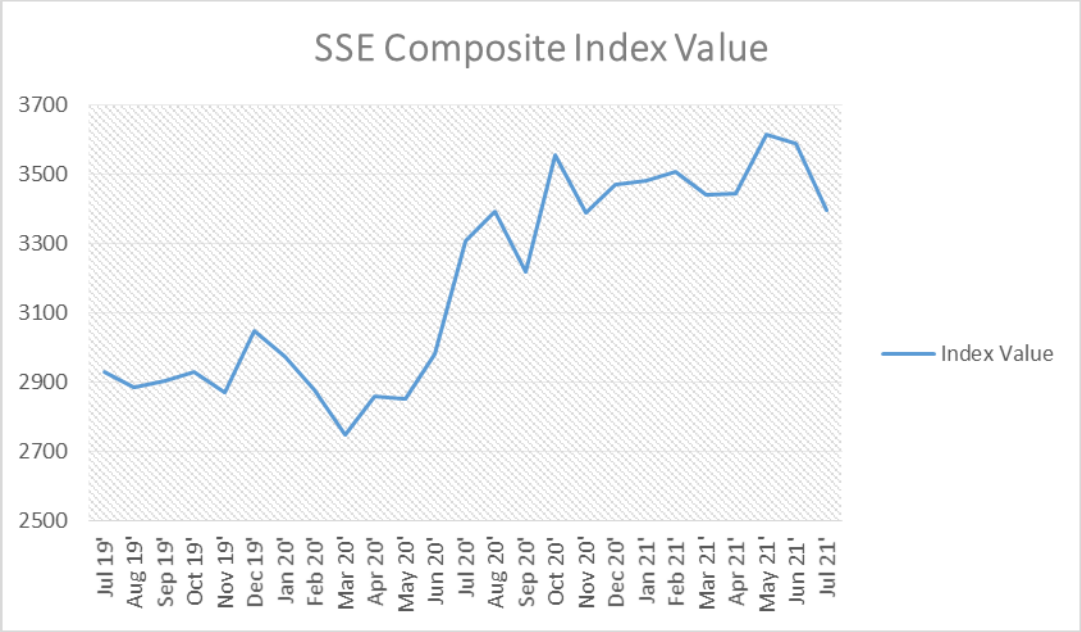
Source: Statista. (2021). Retrieved August 26, 2021, from https://www.statista.com/statistics/1104278/weekly-performance-of-djia-index/

When we look at European stock markets and the most important indices, we can notice that the decline was also almost a record, but the recovery is still worse than in America. The FTSE 100 had the second greatest one-day drop in history on March 12, 2020, amid the increasing crisis around the coronavirus and concerns of a worldwide recession. The FTSE index hit its lowest point on March 23rd last year, at 4,993.89, but has since begun a timid rebound. With the pandemic continuing, the FTSE 100 index was expected to make a modest comeback by the end of the year. But that index has not yet fully returned to pre-pandemic levels. For instance, the FTSE index was 7,148.01 points on August 27, 2021, which is still below its early 2020 average of approximately 7,500 points. In addition, another European index fell from record high 433.90 on February 12 to 293.04 as of March 23rd last year, but recovered quite well until the end of the year. Since the onset of pandemic, it has risen more than 60%, surpassing its previous all-time high of 433.90 points set in February 2020. On the other hand, as we know the most affected industries were the leisure and travel industries and this is especially seen in the example of the STOXX travel and leisure index movement. Due to the impending pandemic, the price of the index fell as early as the beginning of

the year, and in March it experienced a record big drop to the price of $ 154, and the price a few months ago was an average of $ 260. However, with the relaxation of measures and the growing number of vaccinated, this index returned to its pre-pandemic state at the end of April this year, which confirms the positive trends.

When we talk about indices, it is very interesting to look at the movement of one of the largest Chinese indices, the SSE (Shanghai stock exchange) composite. On the Figure 14, we can see movement of the index prices since July 19, 2019 to July 19, 2021. At first glance, it is noticeable that the SSE composite has a rapid rise in 2020 and 2021. In the midst of the pandemic, the SSE composite experienced a significant drop of almost 10%, but from that moment until now the price of the index has been growing continuously and has reached a 20% higher price compared to record levels in the pre-pandemic period. Whether the reason is in the rapid recovery from the pandemic and putting the virus under control, or in the fact that China has been strategically and structurally difficult to grow and connect with the rest of Asia for the last few years, it is difficult to distinguish. Based on this index, we can conclude that China has recovered much faster than the rest of the world, but other countries have also reached previous levels in a very short time, and some like America have achieved record high growth in the last few weeks.

Figure 14 Monthly development of the SSE Composite index from July 2019 to July 2021



Source: Statista. (2021). Retrieved August 26, 2021, from https://www.statista.com/statistics/452963/monthly-sse-composite-index-performance/

4.3. Global market caps pre and post COVID-19

"Market capitalization is a financial term used to denote the total value of tradable shares of a listed company. It is calculated by multiplying the share price by the number of shares outstanding." (Statista, 2021). If we look at the market capitalizations of the three largest stock exchanges in the world, we can also conclude that in this segment this year is extremely successful compared to 2019.

In 2019, the New York Stock Exchange, the world's largest financial market, had a market capitalization of $ 23.2 trillion, and the current market capitalization is $ 25.3 trillion, which is almost a 10% higher amount.

The second largest stock exchange in the world, NASDAQ, had a capitalization of 12.5 trillion dollars in 2019, while this year it amounts to 22.11 trillion, which is almost twice as much.

The reason for such growth in NASDAQ's market capitalization is that some tech giants like Apple, Google and Microsoft are listed there and have doubled their capitalizations this year due to the fact that many online events have taken place across their platforms.

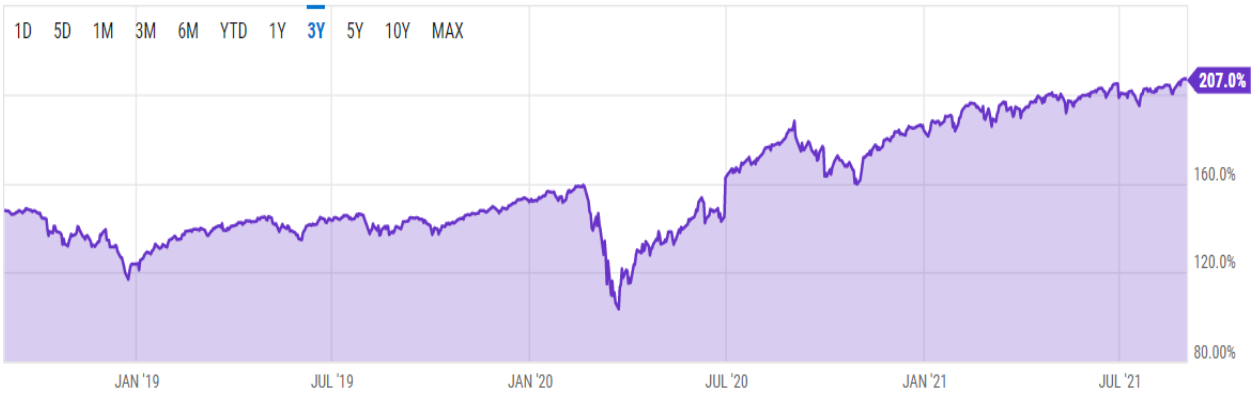
The Shanghai stock exchange is currently the third largest stock exchange in the world with a market capitalization of $ 7.6 trillion, and in 2019 it was 4.6 trillion dollars. Such an increase in the market capitalization of SSE is due to the fact that the Chinese capital market is playing an increasing role worldwide. China's stock markets currently have the world's second-highest total value. Foreign investment has increased access to China's capital markets as a result of the Chinese government's continuous and aggressive reform and opening-up initiatives because of the recent trade war between the US and China. In addition, Asia and China have developed a better connection that will also affect the rapid growth of the eastern stock markets.

An important ratio for monitoring market activity is the ratio of total market capitalization to gross domestic product. On the example of the USA, we can see how the total market capitalization decreased drastically during the coronavirus. Namely, at the beginning of 2020, the total market capitalization in the US was 153% of GDP, and during the corona crisis it fell sharply to 103% of GDP. The recovery followed fairly quickly, so as early as the beginning of September 2020, the total market capitalization amounted to 187% of GDP. Until the end of August 2021, market capitalization grew gradually and moderately until it reached a record 207% of GDP as it can be seen on Figure 15. On the other hand, the current Chinese market capitalization is 67.41% of GDP. At the end of 2019, the market capitalization was 60.03% of GDP in China, and in the midst of the corona crisis, the ratio fell by only 4%, which is an extremely small decline. Such a small decline can be explained by the great strength of the Chinese economy and the rapid bringing of the pandemic under control. When we consider that the Chinese economy has grown by 8% since the pandemic, the current high market capitalization ratio is a signal of high growth in Chinese stock markets.

Based on data from two world powers, we see that market capitalization has been growing faster than GDP since the pandemic. This may be an indication of extremely positive trends among market investors, but also an excessive growth of market capitalization compared to GDP could cause systemic risk and higher market volatility.

Given that the economy has not fully recovered, it is to be expected that this ratio, especially in the US, will decrease after the end of the pandemic. But it is also important to point out that from market capitalizations we can see that markets have recovered fairly quickly from the initial shock.

Figure 15 Monthly ratio of the U.S total market capitalization to GDP from January 2019 to August 2021



Source: YCharts. (2021). US Total Market Capitalization. Retrieved August 26, 2021, from https://ycharts.com/indicators/us_total_market_capitalization

4.4. Central bank and government measures

To avoid a major economic downturn, recession, and the long-term consequences caused by the pandemic, state governments along with central banks had to enact various monetary and fiscal measures. The immediate objective of central banks was to soften the economic downturn by ensuring that the financial system ran smoothly. As the use of lockdown measures became more common, central banks began to rely more heavily on loan operations. These measures supplied banks with liquidity, allowing them to lend to companies hit by the containment measures. At the same time, central banks throughout the world, particularly in emerging markets, launched foreign currency operations to relieve exchange rate pressures and lower volatility.

Asset acquisition announcements became more common as time went on. Central banks first concentrated on strengthening market functioning, but as the crisis progressed, their attention shifted to enabling private and public sector funding.

The illiquidity experienced by households and businesses as a result of the shock's negative impact on both supply and demand was a unique feature of the crisis. Central banks reacted by making loans more accessible to workers and businesses. They also expanded their traditional crisis position as lenders of last resort to the financial sector by becoming liquidity providers to the private non-financial sector.

Following the outburst of Covid-19, the first measure for many central banks was a reduction of policy rates to ease funding costs and support aggregate demand. Rates were lowered in many advanced economies, with the exception of Japan and the Eurozone, where they were already negative. Brazil, Mexico, Peru, and South Africa's central banks all cut rates by more than 200 basis points, while Chile, Colombia, the Czech Republic, Hong Kong, Israel, India, the Philippines, Poland, Russia, Singapore, the United Arab Emirates, and Vietnam all cut rates by more than 100 basis points.

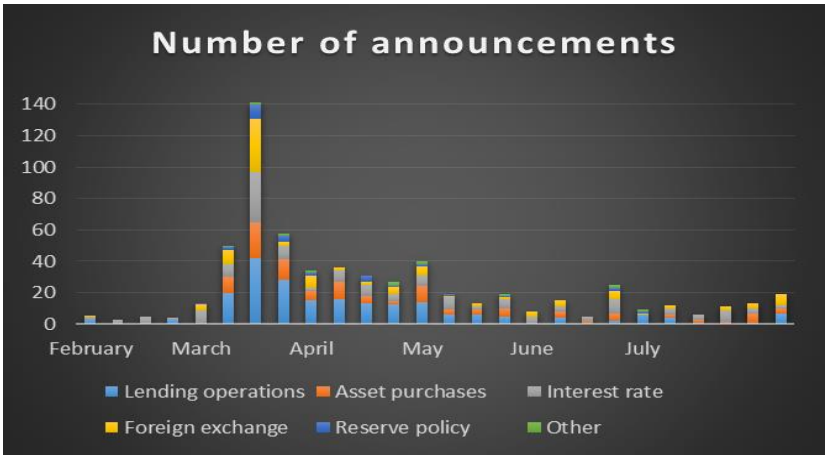
With low policy rates, central banks changed reserve policies to free up funds more swiftly, providing financial institutions with more liquidity. Only three nations from advanced economies: Austria, Switzerland and US changed their reserve policies, and the majority of the modifications included changes in remuneration. Reserve policies were more widely used in EMEs. In the majority of situations, it included a change in required ratios. The Central Bank of Brazil, for example, pumped about BRL 68 billion (USD 12 billion) by lowering reserve requirements on time deposits from 25% to 17%. In many other situations worldwide, the reduction in reserve needs was constrained.

In addition, the implementation of a wide range of balance sheet measures was a key component of the crisis response. Around 60% of loan operations policies in both advanced economies and emerging economies involved the establishment of new programs rather than the continuance of existing ones. The Federal Reserve, the Bank of Canada, and the Bank of Japan, for example, expanded the number of repurchase agreements available and extended their maturities. Central banks in EMEs have increased the number of eligible counterparties and broadened the scope of their current liquidity facilities by decreasing rates and widening suitable collateral. The fact that a substantial portion of new lending policies targeted the private sector was one of the most significant differences between existing and new lending rules.

Targeted lending programs were developed by the Federal Reserve, the Bank of Japan, and the Bank of England to give cash to banks on favorable terms in exchange for loan extensions to small and medium-sized businesses.

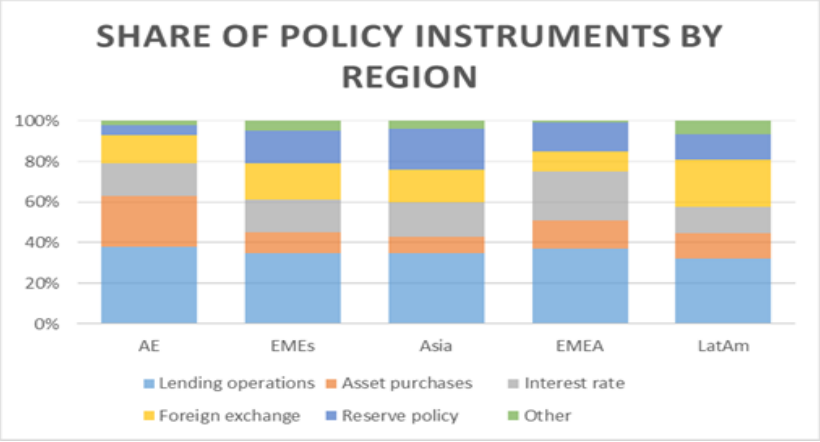
These are some of the most important measures adopted by central banks, and in addition to the above, banks have also implemented various policies regarding asset purchase, bond swaps and foreign exchange operations. (Bank for international settlements, 2021)

Figure 16 Weekly announcements of policies by category



Source: Bank for International Settlements. (2021). A global database on central banks' monetary responses to Covid-19. Retrieved September 26, 2021, from https://www.bis.org/publ/work934.pdf

Figure 17 Share of the policy instruments by region[2]



Source: Bank for International Settlements. (2021). A global database on central banks' monetary responses to Covid-19. Retrieved September 26, 2021, from https://www.bis.org/publ/work934.pdf

Together with central banks, governments have made great efforts to reduce financial disruption during a pandemic and to keep economies at a level of development from which they should easily return to pre-pandemic times. Government measures had a much smaller impact on financial markets than central bank measures, but they contributed greatly to preventing too much economic downfall as this would have a major impact on financial markets. In many developed but also emerging countries, governments have provided support for workers' wages to all firms that have been barred from working due to lockdowns and travel bans. A number of tax reliefs were granted:

[2] Advanced economies= AU, CA, CH, DK, EA, GB, JP, NO, NZ, SE and US; Emerging Asia = CN, HK, ID, IN, KR, MY, PH, SG, TH and VN; Europe, the Middle East and Africa = AE, CZ, DZ, HU, IL, KW, MA, PL, RO, SA, TR and ZA; Latin America = AR, BR, CL, CO, MX and PE.

moratoriums on tax debts, adjusted prepayments, sequestrations suspended. Due to financial overloading, the obligation to file for bankruptcy has been deferred for quite long period of time in many countries worldwide.

By April 24 2021, the United States itself had set aside over $5 trillion in federal assistance packages and other measures to battle COVID-19 and sustain the economy. The Federal Reserve Bank of New York has taken a number of steps to help the economy: interest rates were cut to zero, at least $700 billion in government and mortgage-related assets were acquired and credit streams totaling $300 billion were formed. To make loans more accessible, the eligibility for lending processes has been changed and increased.

On the other hand, at the beginning of the pandemic the Chinese central bank announced a decrease in banks' required reserve ratio, freeing up 550 billion Yuan (70.6 billion euros) to assist the economy, after unblocking loan extensions or renewals to firms at the end of February. A wide range of policy initiatives supporting SMEs have also been introduced at the regional level in China. Deferred tax payments for SMEs, cheaper rent, waived administrative fees, subsidizing R&D expenses for SMEs, social insurance subsidies, subsidies for training and purchasing teleworking services, and lower loan rates are just a few examples. Furthermore, banks have been given additional cash to help SMEs get loans. Due to all measures and rapid prevention of the virus, China has recovered quickly, it is expected to grow even more this year, according to some estimates of the World Bank, it is expected to grow by 8.5%

The EU has made a number of steps to relax its budgetary constraints and assist member states' public spending. The European Commission has temporarily modified its state assistance regulations to allow member states to help their firms, banks, and economies. The EU institutions opted to activate the Stability and Growth Pact's General Escape Clause, which enables member states to depart from budgetary targets and raise public spending. The European Commission suggested changes in its two Corona Response Investment Initiatives to make EU funding more flexible and simple to utilize in the fight against the pandemic totaling €54 billion in public investments, including the European Social Fund. The European Stability Mechanism developed a Pandemic Crisis Support, based on its Enhanced Conditions Credit Line , which allows euro area member states to request assistance of up to 2% of their GDP (as measured at the end of 2019). (ECB, 2021)

4.5. Why pandemic did not have more significant impact on financial markets?

After looking at the aforementioned facts and figures related to global financial markets and the world's largest stock exchanges, we can conclude that covid-19 in its beginnings caused a big shock resulting in historically low index prices and high market volatility. At the height of the pandemic, the forecasts were extremely unfavorable and extremely sluggish recovery and growth was expected in some countries. What is the reason that the situation in the financial markets in the end was much better than anticipated?

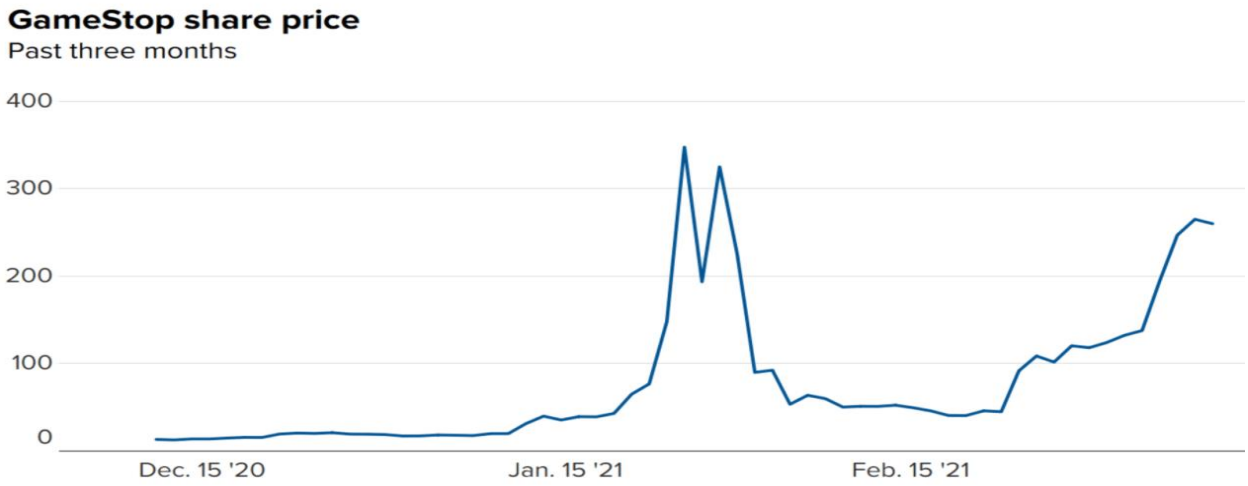
As systemic risk, macroprudential regulations, fiscal and monetary policy, and measures and support from governments and central banks around the world have been discussed at length during the paper, the answer is self-evident. It is widely believed that Covid-19 in its beginnings caused a much more negative moment than it was realistic, largely due to sudden radical measures such as border closures, travel bans, lockdowns, bans on many service businesses and the extremely rapid spread of the virus in the initial phase and due to the widespread anxiety about the completion and scale of the consequences of the pandemic among the public, but also investors in the markets. Despite measures that have been restrictive for quite some time, governments and central banks together with financial regulators have reacted in a timely manner and prevented the collapse of the market. From all the information gathered about Covid-19 and the parallel development of financial markets, we can see that a lot of effort has been invested in good regulation, which in itself does not allow for great instability caused by exogenous shocks. Since the global financial crisis, the authorities have made great efforts to prevent the recurrence of similar instabilities and to prevent deregulations that would favor banks over-risky investments in high-risk, but high-return derivatives. An extremely important factor in financial terms for a pandemic, according to many experts, is the record low level of interest rates for overnight loans between depositary institutions in the money market. After the global crisis, the level of Fed interest rates was extremely low and constantly ranged between 0% and 2% with small growth in 2018 to 2.5%.

From the onset of the pandemic until now, interest rate levels have been at record lows in all countries of the world, especially in America and Europe where they ranged between 0% -0.25%. Due to such a low interest rate period, and especially during the pandemic, companies had more than enough security to finance their operations and ambitions at low borrowing rates. It is this fact that money can be borrowed extremely cheaply, leaving such good potential for future higher earnings, that the decline caused by the pandemic has been short-lived and in fact insignificant for most markets.

Also, a very important factor for the unexpectedly rapid growth of the market is the emergence of small investors in large numbers. These are mostly younger investors who use no-fee digital platforms that allow them to trade stocks quickly and easily, and in this way these small investors increase the volume of the market and the growth of the index itself. Call option sales are multiples of previous years' record volumes, indicating that younger investors are embracing speculation like never before.

A company named GameStop is a clear example of how young investors can positively influence markets using digital platforms. A GameStop was given up for death by many investors as we can see from the Figure 18, but it experienced positive shock due to a group of retail investors. Instead of calling their brokers, these traders turned to internet. WallStreetBets, a forum on Reddit, became a powerful force in market activity. When that stock was shouted at Reddit, a youth forum, it experienced rapid growth as we can see in the Figure 18. Due to the large number of young investors, the share price quickly reached its peak. This is one of the factors that experts often cite as the reason why the market has not experienced a big decline.

Figure 18 GameStop share price from December 2020 to February 2021



Source: CNBC. (2021). A stunning fall and a recovery: How the stock market has evolved one year since Covid hit. Retrieved September 26, 2021, from https://www.cnbc.com/2021/03/12/a-stunning-fall-and-a-recovery-how-the-stock-market-has-evolved-one-year-since-covid-hit.html

Lastly, it is important to mention that the growth of some industries such as tech-industry has outperformed the decline of other affected industries as is the case in NASDAQ where market capitalization has increased almost 4 times compared to 2019. Therefore when we talk about a generally rapid recovery, we do not take into account that some industries have recovered a lot faster than the others, but overall the repeal of the measures led to a general recovery. Along with the positive news and the gradual relaxation of certain measures that enabled the re-freedom of movement, there was a much more stable situation in the markets due to the reopening and better economic situation. Therefore, we can conclude that we have a much better economic situation than expected thanks to good regulations, timely and appropriate monetary and fiscal policies, the previous stability of financial markets as a result of the 2009 crisis and the rapid discovery of vaccines. Last but not least is also a psychological component that was extremely negative at the time of the introduction of the measures, and my personal opinion is that people and the public expected that such a situation imbued with radical measures would last much longer, and this affected the economy and stock markets.

5. EFFECT OF COVID-19 ON ZAGREB STOCK EXCHANGE

5.1. History and development of Zagreb Stock Exchange

The Zagreb Stock Exchange exists informally since June 15, 1907, when it functioned under the name 'Section for Traffic Effects and Goods' under the former Chamber of Commerce, and produced great results in their first week of operation. The Zagreb Stock Exchange was closed in 1945, and the archive of the Stock Exchange was mainly destroyed, but we can conclude that the Stock Exchange's early history played a critical role in integrating the Croatian economy into the European economy. At a meeting of the founding board on December 25, 1989, it was agreed to initiate an initiative for the creation of the joint stock company Zagreb Capital Market (ZTK), to compile a list of the first possible founders, and to begin ZTK's commercial operations.

The first transaction was completed on March 30, 1992, using bonds issued by the Mali Lošinj firm Jadranka d.d. TEST-1, the Exchange's first electronically networked trading system, was deployed in March 1994. (Telecommunication Trading System). The technology allowed Zagreb Stock Exchange members to trade directly from their workplaces using a personal computer and modem for the first time. On September 1, 1997, the calculation of the first stock index of the CROBEX Stock Exchange (Croatian Bourse Index) began. CROBEX surpassed prior records more than 20 times in 2004, and was a third higher at the end of the year than it was at the start of the year. The market capitalization has grown by 70%. The number of bonds has been doubled, and municipal bonds have been included for the first time. Regular share turnover grew by 57 percent in 2007, market value climbed by 78 percent, and the number of transactions more than quadrupled from the previous high point in 2006. All traders in the stock markets had a rough year in 2008. CROBEX is down 67 percent from a year ago, with turnover down a fourth. The capital of the Zagreb Stock Exchange has been increased to HRK 40 million. After the financial crisis, the stock market recovered only in 2010 with continuous growth and continued trading until today.

5.2. Stock Market performance trend before the pandemics

The best way to monitor stock market movements on a particular stock exchange is to plow the stock market index, in this case an index called CROBEX - the mean value of the best shares quoted and traded on Zagreb Stock Exchange. There are currently 18 companies within CROBEX. As a time period of index movement before coronavirus, we took the period from 2017-2019. According to zse.hr statistics on domestic capital market investment activity, CROBEX's total share turnover in 2017 was HRK 1,927,411,806.08 with an average daily transaction of HRK 7,709,647.22. CROBEX 2017 lowest point value was 1,796.61 points, while the maximum point value was 2,246.34 points. With a total turnover of HRK 26,480,390.94, 2018 is the year with the highest share trading turnover in the CROBEX composition. In terms of CROBEX's movement, it reaches its highest point at the start of the year, with a value of 1,886.91 points. The lowest value was close to 1,700 points, but not quite.

The year 2019 was extremely economically strong for Croatia, and many were economically on the rise with record results. These trends have spilled over to the Zagreb Stock Exchange. CROBEX attained its maximum point value of 2,024.61 points in the fourth quarter of the year, while its lowest point value was 1,726.78 points. The overall realized turnover of shares within CROBEX for 2018 was HRK 1,350,953,901.46, up 7.2 percent from the previous year and confirming the favorable trends. From the review of CROBEX movements, to conclude that in the pre-pandemic period the stock market grew continuously with respect to the amount of the index and the turnover.

Figure 19 Highest, lowest and average points of the CROBEX index in the 3 years before the pandemic

CROBEX movement from 2017.-2019.			
Year	Highest point	Lowest point	Average
2017.	1,796.61	2,246.34	1,937.88
2018.	1,705.20	1,886.91	1,811.22
2019.	1.726,28	2,024.61	1,873.31

Source: CROBEX. (2021). Retrieved August 26, 2021, from https://zse.hr/hr/indeks/365?isin=HRZB00ICBEX6

5.3. Performance and state of the market after pandemic

On February 24, 2020, the first verified case of corona virus infection in Croatia was reported. The local capital market was struck by a significant sell-off, sending all index components into negative territory. CROBEX plummeted to 1,364.98 points at the end of March, down 33.59 percent from its peak of 2,055.32 points at the end of January 2020. In the period after the introduction of strict measures, the turnover on the stock exchange decreased significantly and the lowest recorded turnover was a miserable HRK 757,624, while at the beginning of the same year the highest recorded turnover was slightly more than HRK 40 million. The bad atmosphere on the international stock exchanges, which registered the biggest weekly losses since the 2008 financial crisis, resulted in a significant drop in the share price on the Zagreb Stock Exchange. May and June with minimal opening and relaxation bring market stability, but still nowhere near the previous level.

It is only at the beginning of September 2020 that a somewhat more positive trend begins in the midst of the announcement of the invention vaccine, as well as on world stock exchanges. At the end of 2020 and the beginning of 2021, the upward trend of CROBEX begins, and in June this year CROBEX reached a value of 2,006.35, and the previous closing value was 1,971.09, which is proof of a good recovery.

In addition to the positive trend this year, a new record amount of CROBEX can be expected, but a return to record levels from 2016 can be expected only after the official end of the pandemic. All in all, the movements on the Zagreb Stock Exchange more or less followed the movements on the world stock exchanges, and it can be concluded that the stock exchange and the CROBEX index experienced the biggest shock since 2008, but the recovery, although not strong, followed quickly.

5.4. Croatian National Bank interventions

The CNB, as the institution responsible for conducting monetary policy in Croatia, had to implement some measures that should reduce the negative impact of the pandemic. In this section, we will review some of the most important measures adopted by the CNB.

The CNB implemented the following monetary measures to combat Covid-19:

- purchase of government bonds to support stability of the government bond market;
- structural and regular operations to provide kuna liquidity for financing of the economy;
- foreign exchange interventions to support stability of the foreign exchange rate.

One of the first reactions to the Covid-19 crisis was the purchase of bonds of the Republic of Croatia in order to increase money supply. In that bond purchase, the CNB expanded the circle of participants with the aim of stabilizing the financial system. Likewise, the CNB increased the liquidity of the banking system through regular open market operations. In order to release additional liquidity, the reserve rate was reduced from 12% to 9% and the CNB reacted on several occasions by selling or buying foreign exchange to stabilize the exchange rate. With the European Central Bank, the CNB has agreed to establish a currency swap. With a currency swap, if necessary, the CNB will be able to provide Croatian credit institutions with additional liquidity in euros, without using its own international reserves. All these monetary measures, led by open market operations, gave a dose of confidence to credit institutions and other firms because the CNB was constantly increasing kuna liquidity and thus enabling credit institutions to meet all customer needs for kuna loans. (CNB, 2020)

Supervisory measures implemented by CNB during Covid-19:

- The CNB has suspended some supervisory activities such as supervisory stress testing, direct supervision of operations and reduced additional supervisory capital requirements
- The CNB provided credit institutions with the possibility to reclassify individual A clients in order to reduce further deterioration in the financial condition of clients. Also, the Credit Institution in the specified period can still classify these clients as A clients and does not have to set aside provisions for them.
- Alignment with the measures and positions of the ECB and the EBA.

All of these measures have helped banks deal with the burning issue of the pandemic, and the measures have given banks more room to decide how to deal with high-risk clients who have been heavily affected by the corona. Namely, CNB used the above described method of classification of placements to allow credit institutions to decide whether or not to use forced collection measures (foreclosures, collateral) to collect debt from debtors who do not pay three installments of their credit obligations in three months. In addition to monetary and supervisory measures, the CNB has implemented some measures in the payment system, in particular those measures related to the increase of the maximum amount that can be paid contactlessly. (CNB, 2020)

5.5. Measures taken by European Central Bank

To enable European Union countries and economies to more easily suffer the shock caused by Covid-19 disease, the European Central Bank (ECB) has enacted several important monetary measures. These are the following measures:

1. To begin with, the bank announced a pandemic emergency purchase program with funds amounting to 1.850 billion dollars. This program was designed to reduce borrowing costs and increase lending capacity in the euro area.

2. The ECB kept interest rates at record low levels in order to make borrowing as easy as possible. Thus, the cost of borrowing for corporations was at an average level of 1.5%, overnights deposits interest rate for corporations were slightly below zero, and deposit interest rate with agreed maturity for corporations was at an extremely low level, approximately -0,8%.
3. The ECB has increased the amount that banks can borrow from them and has made it easier to lend to all participants who have been hit hard by the pandemic. To mitigate borrowing, the ECB reduced the standards and rules for collateral that banks had to provide as a form of insurance when they land money.
4. The ECB has offered the possibility of immediate borrowing options at low rates that ensure short-term needs of businesses.
5. The ECB was less demanding about the capital that banks have to keep as a reserve for difficult times. The ECB therefore allowed banks to make full use of capital and liquidity buffers.
6. Currency-swap lines were established to preserve stability through international cooperation.[3]

These are the most important measures that have greatly helped banks and all companies to overcome the crisis more easily, and from these measures we can conclude that the ECB has made great efforts to mitigate the effects of the crisis. It is the low interest rates and the easing of loan applications that have greatly helped the financial markets recover in a quite short period of time.

[3] ECB. (2020). Our response to the coronavirus pandemic. Retrieved from https://www.ecb.europa.eu/home/search/coronavirus/html/index.en.html

Also, ECB implemented some supervisory measures such as:

1. Relief measures regarding asset quality deterioration and non-performing loans
2. Relief measures regarding the operational aspects of supervision
3. Relief measures regarding capital and liquidity requirements [4]

In times of difficulty, it is critical to continue recognizing and reporting asset quality deterioration and the accumulation of nonperforming loans in compliance with existing laws in order to keep a clear and accurate picture of risks in the banking sector. Simultaneously, flexibility and reliefs given be ECB should be used to assist banks in absorbing the impact of credit risk developments and mitigating their procyclicality. It was the ECB's relief measures that enabled banks to postpone various controls such as TRIM investigations and internal model investigations. Likewise, banks were not required to submit full reports but only essential elements related to the crisis mitigation plan, thus enabling them to implement the plan on time. Relief measures regarding capital and liquidity requirements enabled banks to potentially finance about 2 trillion euros of loans to the corporations and households, while the risk of lending remained relatively substantial.

[4] ECB. (2021). FAQs on ECB supervisory measures in reaction to the coronavirus. Retreived from https://www.bankingsupervision.europa.eu/press/publications/html/ssm.faq_ECB_supervisory_measures_in_reaction_to_the_coronavirus~8a631697a4.en.html#_Section_1_%E2%80%93

6. CONCLUSION

The appearance of Covid-19 caused a great shock in all segments of society. The pandemic has caught us all together unprepared and the sudden radical reactions of the authorities and epidemiologists have left a great impact in social and economic terms. As the world has not experienced such a threat for a long time, the initial reactions may have been exaggerated from the current position, but it is difficult to blame anyone for the initial shock.

As enough time has now passed since the threat appeared, there are enough indicators that can determine the extent of the virus by financial markets. The initial shock and general fear spilled over to the economies and financial markets, and after an increase in the number of cases and stricter measures, there was a sharp decline in economic activity and stock market indices. There was a great fear of the illiquidity of credit institutions due to a large number of prohibitions, this problem of illiquidity would greatly affect the entire economic system because credit institutions are a key medium for getting funds. As we can conclude from the stock market indices and prices of some large stocks, in the initial period there was high volatility accompanied by financial disruptions on the market and a justified fear of systemic risk.

All this risk and volatility has been fueled by macroeconomic indicators such as high unemployment and falling GDP in most countries around the world.

However, after record low levels of some world indices during the strongest pandemic and lockdown, stock markets and economies stabilized fairly quickly with slight relaxation of measures and the announcement of finding a vaccine. Many stock exchanges already at the end of the introductory endemic year recorded the same levels as in the pre-pandemic period, and this year we are witnessing record levels of some indices and record market capitalization of stock exchanges such as NASDAQ and SSE. Likewise, economic indicators in most advanced economies are growing, suggesting that recovery from coronavirus-induced shock was rapid and V-shaped. Also, it is important to point out that some industries such as hotels, restaurants and airlines are much more affected by the pandemic due to the work measures, so their recovery was not nearly as fast as, say, the recovery of technology giants and other sectors whose work was not affected by the measures.

The reason for the rather good reaction of financial markets to the pandemic is the good regulation of credit institutions after the collapse of 2008. Good regulation of banks has resulted in a fairly large liquidity and capital buffer, which has made credit institutions and its customers more resilient to shocks. The central banks responded in a timely manner with the measures outlined in the paper, thus providing additional liquidity to the entire market and ensuring the stability of the system. Therefore, we can conclude that the timely reactions of the authorities and central banks, good regulation and the situation of credit institutions pulling tails from the financial crisis and the rapid discovery of vaccines are important factors that signaled positive trends and made recovery from the crisis faster and less lasting consequences.

LIST OF FIGURES

REFERENCES

Statista. (2021). Impact of covid-19 on the global financial markets. Retrieved from https://www.statista.com/topics/6170/impact-of-covid-19-on-the-global-financial-markets/

Bullard, J., Neely, C. and Wheelock, D., 2009. Systemic Risk And The Financial Crisis.

Worldometer. (2021). Retrieved from https://www.worldometers.info/coronavirus/

NYTimes. (2021). Coronavirus-timeline. Retrieved from https://www.nytimes.com/article/coronavirus-timeline.html

Financial Markets and Institutions, Global Edition, 7th Edition, 2011, Frederic S. Mishkin and Stanley Eakins, East Carolina University.

Zagreb Stock Exchange. (2021). Povijest zagrebačke burze. Retrieved from https://zse.hr/hr/povijest-zagrebacke-burze/2155

AJMC. (2020). A timeline of Covid-19 developments. Retrieved from https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020

ECB. (2020). The Volatility Of Financial Markets. [online] European Central Bank. Retrieved from https://www.ecb.europa.eu/press/key/date/2003/html/sp030702.en.html

NBER. (2020). Do Global Pandemics Matter for Stock Prices? Lessons from the 1918 Spanish Flu. Retrieved from https://www.nber.org/system/files/working_papers/w28356/w28356.pdf

Stojanović, A., and Krišto, J., 2013. Designing Macroprudential Regulation: Policy, Tools and Early Warning Signals.

Vujcic B. (2020). Measures Of The Croatian National Bank To Alleviate The Economic Consequences Of The Pandemic. CNB.

Schinasi, G., 2004. Defining Financial Stability.

HNB. (2021). Public relations/covid-19. Retrieved from https://www.hnb.hr/en/public-relations/covid-19

Central Banking. (2021). New trends in global capital markets. Retrieved from https://www.centralbanking.com/central-banks/economics/7835361/new-trends-in-global-capital-markets

Bank for International Settlements. (2021). A global database on central banks' monetary responses to Covid-19. Retrieved from https://www.bis.org/publ/work934.pdf

YCharts. (2021). US total market capitalization. Retrieved from https://ycharts.com/indicators/us_total_market_capitalization

ECB. (2020). Our Response to the coronavirus. Retrieved from https://www.ecb.europa.eu/home/search/coronavirus/html/index.en.html

Investor's Business Daily. (2021). Stock Market Forecast For The Next Six Months Foretells New Risks For Investors. Retrieved from https://www.investors.com/news/stock-market-forecast-next-six-months-poses-new-risks-for-investors/

Zagreb stock exchange. (2021). Retrieved from https://zse.hr/hr/indeks/365?isin=HRZB00ICBEX6

World Bank (2021). China Economic Update. Available at: https://www.worldbank.org/en/country/china/publication/china-economic-update-june-2021

Yahoo finance. (2021). The 5 craziest moments in Dow's 125-year history. Retreived September 8, 2021, from https://finance.yahoo.com/news/the-5-craziest-moments-in-dows-125-year-history-182908357.html

S&P Global Market Intelligence. (2021). Economic impact of coronavirus likely to be small, SARS data suggests. Retrieved September 8, 2020, from https://www.spglobal.com/marketintelligence/en/news-insights/trending/0iOhfNVk3-CuD6GHP5BklQ2

MarketWatch. (2020). What will the stock market look like in a post-coronavirus world? The bulls are hoping history repeats itself. Retrieved September 8, 2021, from https://www.marketwatch.com/story/what-will-the-stock-market-look-like-in-a-post-coronavirus-world-the-bulls-are-hoping-history-repeats-itself-2020-04-19

CNBC. (2021). A stunning fall and a recovery: How the stock market has evolved one year since Covid hit. Retrieved September 26, 2021, from https://www.cnbc.com/2021/03/12/a-stunning-fall-and-a-recovery-how-the-stock-market-has-evolved-one-year-since-covid-hit.html

Bhole., L.M., (2004). Financial institutions and markets: structure, growth and innovations, 4th edition.

By David S. Kidwell, David W. Blackwell, Richard W. Sias, David A. Whidbee. (2016). Financial Institutions, Markets, and Money.