

BELGRADE STOCK EXCHANGE INDICES IN THE CONDITIONS OF THE COVID-19 PANDEMIC

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Abstract: *The paper aims to present the movement of the Belgrade Stock Exchange index from the beginning of the epidemic in the Republic of Serbia until the middle of 2021, as well as a review of the movement of the most important indices in the world. The global crisis, caused by the spread of the virus, but also by rigorous measures introduced by the entities authorized by the Government, resulted in a decline in general economic activity, economic slowdown in the capital market and, consequently, a decline in stock indices in the world and in our country. The results of the research indicate that, in general, the indices show drastic declines as early as the beginning of 2020, and although they ended the year with a positive trend, most of them have not yet recovered. The indices of the Belgrade Stock Exchange, already weak, despite a certain degree of recovery during the second half of 2020, had a negative trend compared to*

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the year before. It is completely unknown how long the pandemic and the crisis will last, so it is difficult to predict the further course of events, but it is certain that the consequences will be felt for a longer period of time in economic flows, primarily through increased inflation and further deterioration of public finances.

Key words: COVID-19 / stock indices / economic crisis / consequences of the pandemic / BELEX15 / BELEXline.

INTRODUCTION

The first two decades of this century have been hit by two major crises: first, the financial crisis of 2008, and second, the financial and health crisis resulting from the COVID-19 virus and the pandemic declared by the World Health Organization (WHO). For now, the health, but also the economic and financial consequences can only be foreseen, but it can certainly be said that this is one of the most influential crises in global development (So, Chu & Chan, 2021). The COVID-19 virus first appeared in China in December 2019, and by mid-April 2020 it had spread to over 180 countries and caused more than 2 million cases, as well as over 120,000 deaths (WHO, 2021). In addition to the huge health and humanitarian consequences in almost all countries of the world, and especially in the countries most affected by this virus, such as the United States; China; and in Europe Italy, France Germany (Johns Hopkins University, 2022), the pandemic has brought inconceivably serious economic and financial consequences (Tang, Bidon, Jaimes, Whittaker & Daniel, 2020). Nevertheless, government programs, policies, and support packages for businesses and households result in positive market returns (Ashraf, 2020; Wang & Wang, 2021). For instance, changes in the Chinese SSE 180 index and the MSCI World index prices were not significantly correlated with increases of COVID-19 cases. It might be that early interventions by China may have played a role in index price fluctuations (O'Donnell, Shannon, & Sheehan, 2021). Effects on stock returns from government policies may be very positive (Narayan, Phan, & Liu, 2021). The greatest impact of the pandemic on the economies of developing countries, when it comes to financial markets, was observed in terms of stocks, bonds and exchange rates, as well as in terms of capital outflows (Beirne, Renzhi, Sugandi & Volz, 2020). Stock markets around the

world reacted to the Covid-19 pandemic with highly negative returns. Using daily data of Covid-19 confirmed cases and stock market returns from 43 countries, Ashraf (2021) finds evidence that the decline in stock market returns in response to one percent increase in growth in confirmed cases is stronger for the countries with higher national-level uncertainty aversion.

Pandemic has had significant negative impacts on stock markets both locally and globally (Hasan, Mahi, Hassan, & Bhuiyan, 2021). The decline in almost all segments of the economy, the general decline in economic activity and the decline in investment activity on the stock market, resulted in a drastic decline in stock market indices, both in the world and in Serbia.

RESEARCH METHODOLOGY

Statistical methods were used for research, namely the method of analysis and synthesis, while for researching the trend and current situation on stock exchanges, using descriptive methodology, the movement of the most important world indices and the Belgrade Stock Exchange index was monitored. The time aspect of the research included the period of the Covid-19 virus pandemic, which gave the research its relevance to current times. Pandemic control measures and the general situation at the beginning of the pandemic affected the financial markets very unfavourably, which can be seen from the fact that stock exchanges recorded a decline in investment activity by about 20-30% by the end of March (Naidenova, Parshakov, & Shakina, 2020). The subject of research in this paper is the presentation of the movement of two stock indices on the Belgrade Stock Exchange in the pandemic period and the explanation of the decline of these indices as a result of virus spread, compared to the most important world indices in the same period. Based on the available data, the movement of these important parameters of the capital market in Serbia is graphically and textually presented and explained, although that market is not largely developed in the Republic of Serbia. The impact that the pandemic had on the initial decline and movement of the index in general (starting from March 2020) was analysed, in order to prove the hypothesis that the pandemic caused changes and uncertainty in the economy in general. The main focus of the paper is the review and description of the movement of the Belgrade Stock Exchange index since the beginning of the COVID-19 virus pandemic. In order to analyse the

defined topic and subject of research as objectively, reliably and systematically as possible, general-scientific methods of data comparison (with historical monitoring of data) and scientific-research methods of descriptive analysis have been used.

The paper is divided into three parts, in addition to introductory and methodological considerations at the beginning of the paper, and conclusions at the end of the paper. After introductory discussions and reviews of the literature, the movement of the most important indices of world stock exchanges has been presented, followed by the movement of the Belgrade Stock Exchange index, to which the greatest attention was paid.

REVIEW OF PREVIOUS RESEARCH

The basic condition for the normal development of the national economy implies financial markets, which represent a significant part of the economic and financial system of each country (Milovanovic, 2015; Hernandez, Kang, Shahzad & Min-Yoon, 2020). The financial market is an environment in which receivables are emitted and transmitted, and supply and demand for financial instruments are expressed and realized (Petkovic, Bozimovic & Stojanovic, 2018; Hernandez et al., 2020). Through financial instruments, in financial markets, economic entities obtain the funds necessary to finance business or development (Zeren & Öztürk, 2015). The market must be well organized to meet three basic requirements: security in performing operations, reduction of transaction costs and protection of investors (Obradovic, Milasinovic & Bogicevic, 2021). Given that the investor's portfolio usually consists of various stocks, the typical investor's question is "What is happening in the market today?". There are several reasons why investors ask this question (Pjanic, Andrasic & Milenkovic, 2013). First, given that they own different stocks and bonds, it would be too confusing for investors to track the value of each stock and bond to determine the composition of their portfolio; second, investors intuitively assume that the value of stocks and bonds moves parallel to the value of the total market. Therefore, if the market is growing, the value of the individual portfolio of investors is likely to increase. In order to provide investors with comparative reports on market performance, some investment companies and financial publications have developed stock and bond indices (Djordjevic & Ilic, 2012). The current pandemic can have a significant impact on systemic risk in many

financial markets (So et al., 2021). The escalation of the COVID-19 pandemic during 2020 showed, on a global level, the fragility of the world in which we live and how vulnerable the society is to extraordinary risks (Corbet, Larkin, & Lucey, 2020).

AN OVERVIEW OF EVENTS ON WORLD STOCK EXCHANGES

The main role of the index is to unambiguously express the direction and intensity of the movement of the value of stocks that make up the index (Jovetic & Puric, 2016; Kusnadi, 2019). As such, the stock exchange index provides investors with a kind of orientation in terms of market movements in the part of the market to which the index refers. The first stock exchange indices date back to the end of the 19th century, when the American journalist Charles Dow created one of the first indices of the American capital market Dow Jones Industrial Average - DJIA, which is still one of the most famous and popular world indices (Oktavia & Handayani, 2018). His research in the capital market has led to the conclusion that trends do not only accompany reports and information, but there are also various other factors that influence market trends. These studies represented a major advance in predicting market price movements (Ghobadi & Ghobadi, 2015; Djordjevic & Ilic, 2012). In addition to DJIA, the focus of the world investment public is on a daily basis focused on the American index S & P500, the index of the London Stock Exchange FTSE 100, the index of the Tokyo Stock Exchange NIKKEI 225, the Paris Stock Exchange CAC, etc.

Several factors affect investors' interest in investing, including exchange rates and market information (Zainuri et al., 2021; O'Donnell et al., 2021). The proclamation of the pandemic in a large number of countries during the first quarter of 2020 was accompanied by a sharp and drastic decline in the value of stock indices in the capital markets globally.

For instance, global stocks lost market value by nearly USD 6 trillion in just one week (February 24 - 28, 2020), based on S&P Dow Jones Indices, as investors feared a recession due to the COVID-19 (Hasan et al., 2021). Growth in COVID-19 cases largely explained changes in stock prices, as well as in indices. The total daily number of COVID-19 cases explained index price changes in Spain, Italy, the United Kingdom and the United

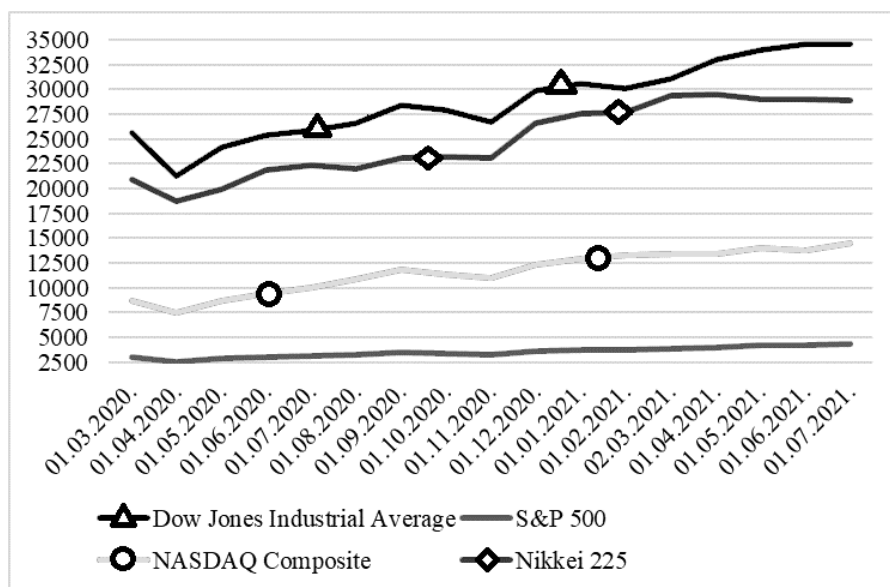
States, but not in China, which is the origin of the virus, nor in the 'global' index - MSCI World (O'Donnell et al., 2021).

March 2020 can be assessed as the most turbulent month in the history of the American stock market for investors, because prices were dizzying, reaching up to 20% change in price in three days, while switches on the US stock market were activated as many as four times within 10 days. The world's most significant indices showed a drastic decline by March, so in mid-March 2020, the US government announced a plan for an economic stimulus of one trillion dollars, including 500 billion to the American people, to mitigate the impact of the pandemic on the economy. Although stock markets have been recovering recently, with the continuation of the pandemic, a high level of uncertainty in stock markets remains (Zhang & Hamori, 2021). The fall in the index on all stock exchanges is certainly caused by the effects that the global pandemic of the Covid-19 virus has left on global economic trends. Due to the impact of the COVID-19 pandemic, global stock markets have become extremely volatile. It is important to say here that the largest US companies in real time had enough strength to start 2021 more positively and thus influence the possibly better movement of the index by the end of this year.

Trading last year was marked by uncertainty about the pandemic and its impact on the economy, which was most noticeable in the first quarter of the year. After COVID appeared in the United States and when measures were introduced to curb the spread of the virus, the indices plummeted. The values of DJIA (Dow Jones Industrial Average), observed in the previous few years, achieved the largest decline in 2020. The Dow Jones index in 2020, despite large declines, ended the year in a plus of about 7.2%. The most monitored and well-known value-weighted index S&P 500 (*Standard & Poor's 500 Stock Price Index*), which includes 500 stocks of large companies, ended the year positively with about 16%. The fall of these two indices in 2020, but also the successful continuation of growth in 2021 are some of the indicators of the power of the American stock market. TOPIX, the main stock index in Japan, lost more than 20% of its value as early as December 3, 2019 (Baker, et al., 2020). DAX, Germany's main stock index, lost more than 10% of its value on March 18, 2020 (Albulescu, 2020). Also, by April 2020, DAX, as the most significant index in Germany, recorded a decline of as much as 26%, and the Japanese Nikkei 225 index a decline of as much as 25% (Rakonjac-Antic & Koprivica, 2021).

Graph No. 1 shows the movement of selected world indices for the period from March 1, 2020 to July 1, 2021. Most countries in the world were facing the beginning of a pandemic and the beginning of rigorous measures since March of the previous year. Some indices have recorded a large decline before, but the largest number of indices in the world shows a steep trend in this period, only to reach its minimum at the beginning or during April. From the chart it can be noticed that the selected four indices – DJIA, S&P 500, NASDAQ Composite and Nikkei reached their minimum as early as April 1, 2020.

Graph 1. *Movement of some of the most important world indices since the beginning of the COVID-19 pandemic*



Source: Authors based on (Verizon Media, 2021)

CURRENT SITUATION AND PERSPECTIVES OF DEVELOPMENT OF THE BELGRADE STOCK EXCHANGE

In the last ten years, the only instruments that could be traded on the Belgrade Stock Exchange were old foreign currency savings bonds of the Republic of Serbia, long-term bonds of two banks (secondary trade almost did not exist), bonds of two local governments, debt securities issued by the state and stocks of privatized companies. Statistically, only about

twenty companies trade stocks on average every day (Jovanovic, 2019). Unlike developed financial markets, the Serbian capital market, despite the growth in the volume of transactions, is generally still very illiquid (Djekic, Nikolic & Vesic, 2019; Dzeletovic & Milosevic, 2017). For a small number of companies whose stocks are actively traded, an inadequate offer of stocks, and a generally "shallow" securities market are the main problems for further market development. The liquidity ratio as a ratio of total turnover and total market capitalization is very low. For the aforementioned reasons, emerging markets are more sensitive and have more difficulties to recover from crises, although the COVID 19 pandemic was a global shock (Beirne et al., 2020).

An efficient capital market accelerates the economic growth of the country, not only by enabling cheaper financing, but also through indirect control of managers, which leads to better business results of companies (Holcomb, Mason & Zhang, 2020). Although it is underdeveloped, trades are recorded on the Belgrade Stock Exchange. Some of the problems that investors face are: lack of clear and predictable rules (laws) of business, equal treatment of all market participants and efficient institutions that provide everything in advance, especially the protection of the rights of minority stockholders. The most important parameters of stock movements on the Belgrade Stock Exchange are BELEX15 and BELEXline.

The essence of *BELEX15* index is to measure changes in the prices of the most liquid stocks on the domestic capital market (Gradojevic & Dobardzic, 2013). The index is calculated daily, in real time, and is weighted by market capitalization. The stock of an individual company is limited to 20 percent (in terms of capitalization value). The stock price used to calculate the *BELEX15* index is any stock price formed in the trading of stocks that make up the index basket, except for the prices realized in block transactions (Dogandzic & Stošić, 2009). *BELEX15* is a market capitalization weighted index, which is not adjusted for paid out dividends, and is not protected from the dilution effect that occurs due to dividend payments. The purpose of the index is to measure changes in the price (price index) of stocks traded by the method of continuous trading, which have previously met the criteria for inclusion in the index basket.

BELEXline is an index that replaced the BELEXfm index in May 2008. BELEXline is an index weighted by market capitalization that is in free

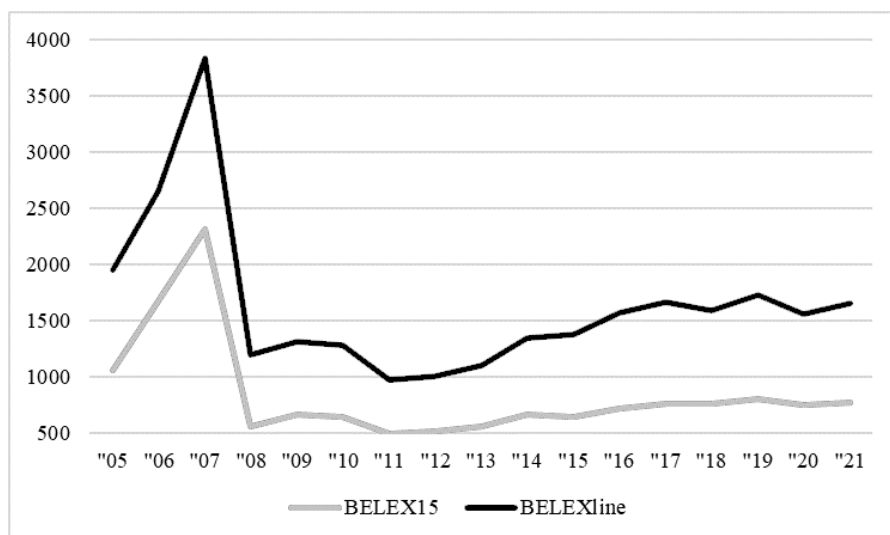
float, which is not adjusted for paid out dividends, and is not protected from the dilution effect that occurs due to dividend payments (Milosevic-Avdalovic, 2018). The weight of the components in the index is limited to a maximum of 10% relative to the free-float market capitalization of the index. The calculation and publication of the BELEXline index is performed every working day of the Exchange market, after the expiration of all scheduled trades for that day. The stock price used to calculate the BELEXline index is predominant, i.e. the closing price formed in trading the stocks that make up the index basket.

The BELEXline index is designed as a basic benchmark for monitoring price movements on the Serbian capital market, and the BELEX15 index is primarily intended to improve the investment process, by measuring the performance of the most liquid segment of the Serbian capital market, and by comparing potential investment strategies. On the other hand, BELEXline is designed in the way that most closely describes the overall (broad market) market movements, while BELEX15 is designed in the way that most closely describes the market movements of the most liquid stocks. Both of these indices can serve as a basis for creating structured products and derivatives in the domestic and foreign markets, and they can also be an analytical tool for portfolio managers, professional analysts, the professional public, investors and all others who study the dynamics of price movements in the Serbian market.

Graph 3 shows the movement of the Belgrade Stock Exchange index from 2005 to July 2021. What is very noticeable on the chart is the growth of the index until the beginning of the World Economic Crisis. In 2008, both indices show a drastic decline compared to the previous year, when the BELEX15 index fell to a value of 565.18 dinars (a decline of -75.62%), while BELEXline fell to a value of 1198.34 dinars (a decline of -68.72%).

Thus, the relative annual change of the BELEXline index in 2008 was as much as -68.72% (Ciric & Njegomir, 2012). After 2008, the indices recorded both positive and negative trends. But for the observed period from 2005 to 2021, the minimum value of both indices was in the year 2011, when the BELEX15 index had a value of 499.05, and the BELEXline index only 977.19 dinars.

Graph 2: *Movement of the value of the Belgrade Stock Exchange index from 2005 to 2021*

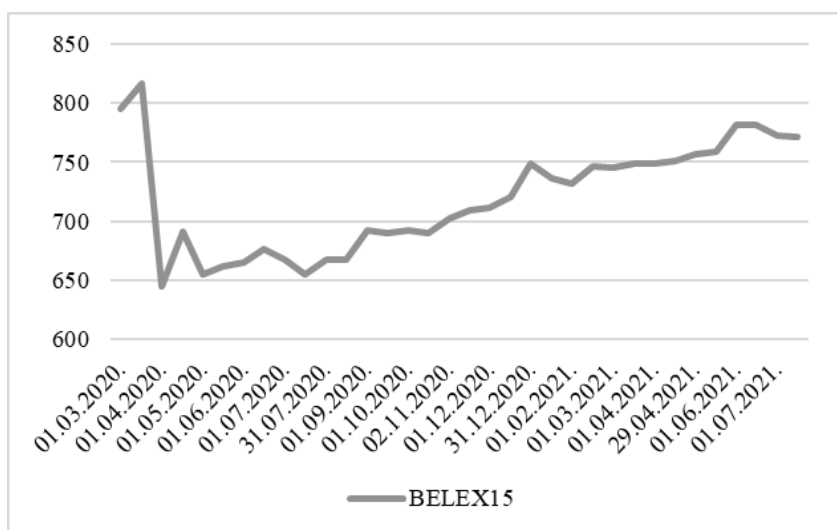


Source: Authors based on (Beogradska berza, 2021)

After 2011, both indices of the Belgrade Stock Exchange grew moderately until 2020, with the exception of 2015 when the BELEX15 index fell minimally compared to the previous year –by 3.44%, and in 2018 when the BELEXline index fell by 4.40% compared to 2017. The movement of the monthly values of the BELEX15 and BELEXline indices for the period from March 1, 2020, when the epidemic was already spreading widely in the world and immediately before the declaration of the state of emergency in Serbia, until July 7, 2021 is shown in Graphs No. 4 and No. 5. If we look at the period from the previous seventeen months, which is shown on the graph, but also when we look at the last three years, the lowest value of the BELEXline index was 1419.13 dinars, and that value was recorded on March 23, 2020. Also, on that date, observing the last three years, the BELEX15 index recorded a minimum value, which amounted to only 606.62 dinars (Belgrade Stock Exchange, 2021).

What is interesting is that the value of the BELEX15 index, in the previous three years, was the highest on February 13, 2020, when it amounted to 816.52 dinars. By the middle of 2021, the index, compared to the previous year, increased by about 4%.

Graph 3. *Movement of BELEX15 index values since the beginning of the COVID-19 pandemic*



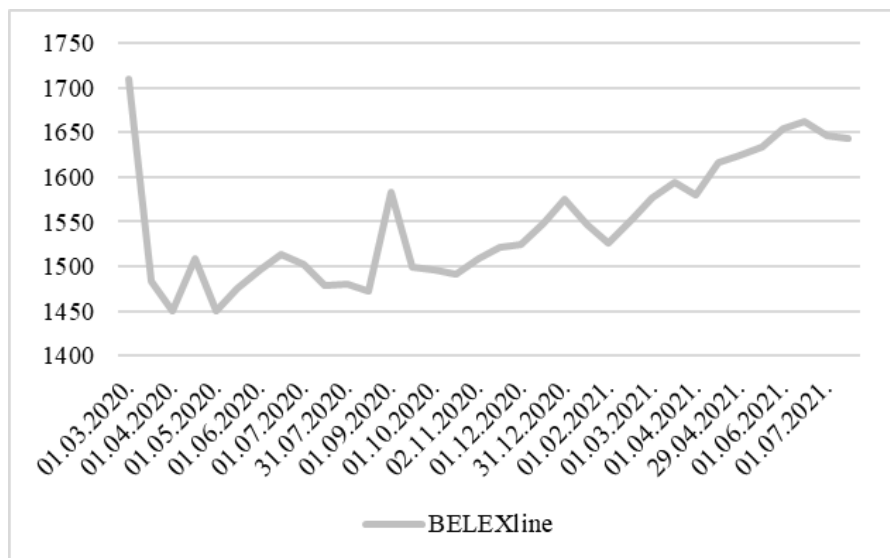
Source: Authors based on (Belgrade Stock Exchange, 2021)

The BELEXline index had the lowest value on March 23, 2020, the same date as BELEX15, when the period from March 1, 2020 is observed, but also when the period from the previous three years is observed. The value of the BELEXline index that day was 1409.41 dinars. As in the case of the BELEX15 index, the value of the BELEXline index, in the previous three years, was the highest in February 2020, more precisely on February 19, 2020, when it amounted to 1771.27 dinars. By the middle of 2021, the index, compared to the previous year, increased by over 5%.

Thus, it can be concluded that, as in the case of world indices, domestic indices fall drastically during the outbreak of the COVID-19 virus pandemic and have their minimum values during March and April 2020. Such values of the index are a consequence of the aforementioned pandemic, but they are also a consequence of the declaration of a state of emergency and rigorous measures that were introduced at the state level in order to prevent the consequences of the spread of the virus. It can be said that the value of the index has been moving somewhat upwards since the beginning of this year. For now, the indices are slowly showing signs of recovery. It is possible that the positive movement of the index is also

influenced by the beginning of vaccination of the population, which took place in January this year.

Graph 4. *Movement of BELEXLine index values since the beginning of the COVID-19 pandemic*



Source: Authors based on (Belgrade Stock Exchange, 2021)

CONCLUSION

The pandemic of virus Covid-19 has significantly disrupted the economy, population, domestic economies of most countries in the world, global relations and the international economy in general. The pandemic has disrupted the functioning of the international market and the relations between the national economies in the world. For now, the consequences can only be guessed in an attempt to predict them, but it is certain that no one can know for sure when and whether everything will return to its previous state, how long the epidemics in different parts of the world will last and what the consequences of this pandemic will be. The interconnectedness of the global market and the influence of political, natural and legal factors have made the whole world to feel the consequences of the pandemic in all fields. During the COVID-19

pandemic, governments in most countries of the world, or organizations authorized by governments, took many actions: restricting international travel, closing schools, introducing lockdowns, banning public gatherings, closing unnecessary businesses, and wearing masks. These measures had a significant impact on economic development, the economy, the capital market, and consequently, on stock market indices.

The declaration of the pandemic and state of emergency in many countries has consequently affected the functioning of capital markets and the sharp decline in the value of stock market indices in the markets, globally. The results of this paper indicate that the most significant world indices show drastic declines as early as the beginning of 2020, and during March and April they recorded the lowest values in the last few years. Some indices, however, ended the year positively, but most have not yet recovered. Furthermore, when it comes to indices on the domestic capital market, i.e. the indices of the Belgrade Stock Exchange, their values were the lowest at the end of March 2020, which is a consequence of declaring a global pandemic, declaring a state of emergency throughout the country and introducing rigorous measures to combat viruses, as well as the appearance of the first cases of infection. In the last few months, the indices show a recovery to some extent, but they have not yet reached the value from before the beginning of the pandemic. Although the indices show positive tendencies, the recovery of the index is slow and uncertain. The question remains what will happen with the pandemic in the future, so the movements on the capital market, and thus the movements of the index, cannot be predicted. However, while economic growth is based on real and verifiable data, the rise or fall of stock prices on stock exchanges is due to the expectations of investors which are often based on economic data. Therefore, if we all see some progress in the future, investors will invest and citizens will take loans, and stocks and indices will jump. We hope for such an optimistic scenario, with caution shown to the creators of monetary policy, since the pandemic can be the trigger for the public debt crisis, which was expected even before the virus appeared in our country.

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INDEKSI BEOGRADSKE BERZE U USLOVIMA PANDEMIJE COVID-19

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Sažetak: Rad ima za cilj da predstavi kretanje indeksa Beogradske berze od početka epidemije u Republici Srbiji do

sredine 2021. godine, kao i osvrt na kretanje najznačajnijih indeksa u svetu. Globalna kriza, uzrokovana širenjem virusa, ali i rigoroznim merama uvedenim od strane entiteta ovlašćenih od Vlade, imala je za posledicu pad opšte privredne aktivnosti, ekonomsko usporavanje tržišta kapitala, i shodno tome, pad berzanskih indeksa, kako u svetu, tako i kod nas. Rezultati istraživanja ukazuju na to da, generalno, indeksi pokazuju drastične padove već početkom 2020, iako su godinu završili sa pozitivnim trendom, većina ih se nije još uvek oporavila. Indeksi Beogradske berze, ionako slabi, i pored određenog stepena oporavka tokom druge polovine 2020. godine, imali su negativno kretanje u odnosu na godinu ranije. Potpuno je nepoznato do kada će pandemija i kriza trajati, tako da je teško naslutiti dalji tok događaja, ali je sigurno da će se posledice osećati dugo u privrednim tokovima, pre svega kroz povećanje inflatornih kretanja i dodatno pogoršanje javnih finansija.

Ključne reči: COVID-19 / berzanski indeksi / ekonomska kriza / posledice pandemije / BELEX15 / BELEXline.