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COVID-19 ĮTAKA EUROPOS SĄJUNGOS KAPITALŲ RINKOS SĄJUNGAI	COVID-19 IMPACT ON THE EUROPEAN UNION CAPITAL MARKETS UNION

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INTRODUCTION

Relevance of the topic. Recent years have seen declining trends in the European Union's growth potential and lack of investment. Sustained reforms and reliable sources of funding are essential to ensure sustainable growth, one of the European Commission's key objectives. Since 2015 The European Commission (EC) has launched an intensive debate on one of the four freedoms enshrined in the Treaty of Rome and is developing plans to pave the way for a capital markets union between 28 member states. The engine of growth and jobs is said to be small and medium-sized enterprises, which were the most difficult to survive in Europe during the 2007-2011 financial crisis due to the cessation of funding due to the refusal of banks to grant loans due to the increased risk of insolvency. Basically investors or shareholders are often interested in a company's performance, its value, as these are important aspects in valuing a company (Kothari, 2001). But as a result of crisis, many companies have gone bankrupt, unemployment has risen, corporate values and the economy have been declined. The European Commission has therefore set itself the goal of creating a Capital Markets Union, which aims to stabilize, strengthen the economy and make it more resilient to financial crises. Thus, the main goal is to address the lack of investment by providing better access to finance for European companies and long-term projects and by diversifying their sources of financing. Compared to the rest of the world, European companies remain highly dependent on bank financing and relatively less on capital markets. The creation of a Capital Markets Union would also increase access to finance for business development, increase employment, remove obstacles to cross-border investment in the EU, foster stronger links with other global markets and increase the EU's competitiveness.

The scientific literature distinguishes between different approaches to the assessment of the EU Capital Markets Union. Some point out certain shortcomings related to the goals and priorities of the EU Capital Markets Union. Elsewhere, it is argued that this initiative is an essential step towards economic progress in the Member States, which should contribute to sustainable growth. It is often emphasized that it is important to focus on cultural change, not forgetting to preserve financial stability during the project, as most EU companies rely on bank financing and lack confidence in capital markets. Also, it is necessary to take into account the effectiveness of already implemented project objectives and measures applied, to pay more attention to regulatory policy. With different valuation approaches, it becomes important to identify the need for an EU Capital Markets Union, to

assess the project design process and development opportunities, and to assess the potential impact on individual market segments, such as the financial market. However, in today's world, we are facing another terrible crisis: COVID-19. This virus has already managed to affect not only the health of loved ones, but also the financial markets. Government restrictions have affected the downturn in business and changes in consumer behavior, as well as the whole economy (Sheth J., 2020). This period has also provided opportunities for some businesses, such as a significant increase in online e-commerce sales (Williams C.C., 2020, Hao N., Wang H. H. and Zhou Q., 2020). In general, financial and economic activities are disrupted. The coronavirus pandemic and because of this caused crisis have caused considerable instability and uncertainty for major stock indices and the capital market as a whole (Ali M., Alam N. and Rizvi, S., 2020, Liu H., Manzoor A., Wang C., Zhang L. and Manzoor, Z., 2020, Saadat et al., 2020, Saadat S., Rawtani D. and Hussain C. M., 2020). In order to ensure that capital markets are sufficiently financially integrated, international links should be established, which would be reflected in the fact that, regardless of where financial products are traded, they must have the same expected rate of return as risk characteristics (Dias R., da Silva J. V. and Dionísio, A., 2019). In this context, this paper reveals the analysis whether the coronavirus pandemic affected the European Union's Capital Markets Union. The data needed by these capital markets for research and during a pandemic crisis is open to research, as it is important to gather reliable data and understand how strong the European Union's capital markets are and how they were affected in the first year of the pandemic. For this reason, this paper will examine what actions the EU CMU is taking, what is the relationship between the coronavirus pandemic and capital markets.

The main *problem* formulated in the work is - will COVID-19 virus affect the EU Capital Markets Union?

The object of the study is the EU Capital Markets Union.

The aim of this work - based on analysis of scientific and journalistic literature, to investigate research methodology and to reveal possible impact of COVID-19 on the EU Capital Markets Union.

Objectives:

1. Based on various scientific and journalistic literature sources to disclose the concept of capital market and to analyze the definition of the EU capital market union;
2. To reveal the opportunities and challenges of the EU capital market development;

3. To develop a methodology for determining the impact of COVID-19 on the EU Capital Markets Union;

4. To prepare a generalized analysis of the impact of COVID-19 virus to the EU Capital Markets Union and to analyze EU capital markets using the method of descriptive statistics;

6. To determine the impact of COVID-19 on EU Capital Markets Union.

Research methods: logical, comparative analysis and systematization of scientific literature in order to analyze the concept of capital market, its impact on the economy of the EU Capital Markets Union and statistical analysis to assess the situation of European capital markets. Furthermore, graphical and modeling methods for correlation-regression analysis. Statistical analysis was performed using Microsoft Office Excel.

Sources of the work: Lithuanian and foreign researchers, EU legal acts, action plans prepared by the European Commission, data of European stock exchanges, world stock exchange federations and other data are used in the preparation of this work.

Work structure: The master 's thesis consists of four main parts. The first part consists of a review of the literature, which defines the definition of the European Union's capital market union, its challenges, the action plan, the political economic framework and the implications of COVID. The second part consists of the development of a methodological part of the work to conduct proper research. The third part of the work consists of several subtopics: the capital market of the European Union is analyzed at the beginning and stock exchanges are analyzed with the help of descriptive analysis. Also there is analyzed an important of the European Union's capital market capitalization ratio and bonds, derivatives, ETF's and stocks. After performing the descriptive analysis and collecting all the necessary data, correlation and regression analysis are applied. The fourth part presents the conclusions and suggestions.

The work consists of 57 pages, 14 figures, 10 tables, 3 pictures. Moreover, 75 sources are used in the work.

1. CONCEPT OF THE CAPITAL MARKET'S AND EU CAPITAL MARKET'S UNION

1.1 Concept of the capital market's

In today's modern life, it is difficult for us to imagine times when human wealth was measured in a completely different way, by methods that are unusual for us. At that time, there were no banks, no securities markets, and no idea came up about the definition of the capital market. However, as the economy evolves, new technologies change old habits, trends in corporate finance start a constantly change between low and high leverage. In today's world, we can see increased economic growth in many countries, which is a consequence of globalization. Countries can afford to disseminate information in a variety of ways without much hassle, but at absolutely minimal cost, and there is also the possibility of free settlement in different foreign countries. This strongly stimulates the demand for financial services.

Factors such as financial instability, especially international ones, have a significant impact on financial integration. It can also be affected by fluctuations in various exchange rates. However, when the world was hit by the first wave of globalization, it was largely supported by British hegemony and the gold standard. Later, when the Bretton Woods mechanism on exchange rates ceased to exist, financial globalization revived. Financial flows did not take place between emerging market countries, but between those countries that are already advanced. (Obstfeld, M., Taylor, A. M., 2003) But financial markets can be classified according to maturity of the claims. The money market is a financial market for short-term financial assets, while the capital market is for long-term financial assets. Traditionally, current financial assets are up to one year long, while non-current financial assets are those with a maturity of more than one year. (Fabozzi, J. F., 2015) According to J. Madura (2012), a financial market is a market in which financial assets, such as bonds or shares, can be bought or sold. In other words, when one party redeems a financial asset from the other party who owned that asset, the funds are exchanged in the financial markets. In this way, financial markets facilitate the flow of funds and provide financing and investment to households, businesses and the state. According to K. Lannoo and Thomadakis A. (2019), the capital market is a market that diverts funds from net savers to those who borrow. Irrespective of the country in which the capital markets are traded, which have fully integrated solutions, assets with the same risk characteristics have exactly the same price. Regardless of the place of residence, the smooth transfer of financial flows helps to ensure that the assets at risk provide the same expected return. Member States need to carefully

harmonize both general bankruptcy and company law, financial services taxation and securities law in order to allow for market integration (a process that ensures the convergence of price and market risk).

Capital markets are generally divided into three types of securities, namely stocks, bonds, and loans (Madura, J., 2012). However, if the question arises, to whom are capital market securities usually issued? The answer is simple, it is usually designed to finance the purchase of cars, buildings or other fixed assets. In today's world, capital markets make a significant contribution to the sale of long-term securities. This is a facilitation when long-term securities in deficit units are sold into surplus units. Also, author J. Madura (2012) argues that the financial market is the market in which bonds or stocks, in other words financial assets, can be bought or sold. Funds are exchanged in the financial markets when one party redeems a financial asset from the other party that owned the said asset. In this way, financial markets facilitate the flow of funds and provide financing and investment to households, businesses and the state. According to A. M. Andries (2009) today, we can no longer imagine our modern economy without a capital market. The capital market is the part of the financial market along with the insurance and money markets. Its importance in the world is undeniable, as it is constantly adaptable, but at the same time plays an important role in the economic environment. This creates an innovative and dynamic structure that ensures equal opportunities for all categories of participants.

The free movement of capital is "the right to invest, purchase assets and securities, to dispose of profits freely in any of the countries participating in the common market". (Ekonominės konsultacijos ir tyrimai, 2007) Long-term economic growth is ensured by investments and an increase in the capital base. The fewer restrictions on the movement of capital, the more investment is likely in countries that are not rich in capital resources (such as the new EU Member States). Foreign direct investments are considered to be particularly useful. (Hansen H., Rand J., 2006) They are usually reluctant to "escape" from the country and are long-term. In addition, foreign direct investments not only increases the capital base, but also promotes technological progress and various spillover effects. Empirical studies have shown that foreign direct investments also had a significant positive effect on economic growth in Central and Eastern European countries: a 1% increase in the foreign direct investments to GDP ratio increases the growth rate *ceteris paribus* by 0.1-0.2 percentage points. (Rapacki R., Próchniak M., 2009)

Moreover, capital movements can also have negative consequences. This is especially true of so-called "hot money", which tends to "come" to the country quickly, but also "escapes" quickly as well. Financial markets can be characterized by large fluctuations. This effect was also felt in Lithuania. High capital inflows in the pre-crisis years, which were partly due to optimism about EU membership, contributed significantly to the consumption boom and economic overheating, real exchange rate overvaluation and loss of competitiveness. This was one of the reasons why the decline of the Lithuanian economy in 2009 was very great and why the development of the Lithuanian economy was so "wavy". However, it should be said that although foreign banks have significantly reduced lending, they have not left Lithuania because they have treated it as a "home market" in which they want to work in the long run. It would be difficult to deny that EU membership has contributed to strengthening this attitude.

Overall, it can be concluded that, although EU membership was not a key factor during the crisis, it mitigated the effects of the crisis. The fact that some of the new member states have been hit so hard by the crisis reveals that EU membership is beneficial, but not a panacea. (Cihak M., Fonteyne W., 2009) According to this analysis, "EU membership has brought some benefits to the NMS during the crisis. This included some financial instruments available to banks in the new EU member states in cooperation with the European Central Bank, which "created important safety pillow". These measures were more relevant for Latvia, Lithuania did not use them. However, if the need arose, Lithuania would also have had the opportunity to take advantage of them, which in turn could have added more investor confidence in the country. EU membership has also avoided protectionist measures that would have exacerbated the economic situation due to the declining exports during the downturn and / or prevented a rapid recovery in exports after the crisis. It should also be noted that the EU institutions supported the policy chosen by Lithuania (as well as other Baltic countries) during the crisis - i.e. y. an internal adjustment strategy based on fixed exchange rate preservation and fiscal consolidation.

Thus, for general purposes, the capital market is a market in which securities are traded. In the capital market, investors buy securities and companies receive funds (capital) for the securities they sell. Fama E. F. and Laffer A. B. (1971) stated that individual firms compete well in the markets for their products, and the capital market is excellent in the usual sense - zero transaction prices, free access to any publicly available information and the existence of excellent substitutes for the company's securities. But capital markets have 2 main entities. As can be seen from a previous

analysis of the literature, in the capital market, one entity provides capital (institutional or retail investors) and the other entity is in need of that capital (government and corporations). Capital markets help the economy to grow and help to be efficient in ongoing transactions. However, we can conclude that capital markets also facilitate securities trading for companies and investors and help ensure the movement of capital.

1.2 Concept of the EU capital markets union

The Capital Markets Union (CMU) is an idea that develops the creation of a single capital market. The Capital Markets Union aims to promote stronger economic growth in the European Union (EU). To achieve this, efforts are being made to create more integrated capital markets by increasing the cost of raising capital, removing barriers to cross-border investment and improving access to finance for businesses. (PWC, 2015) Capital markets tend to be less vulnerable to economic cycles, and investors also tend to take on more risk. The fact that European capital markets are not fully developed and companies are largely dependent on bank financing can be seen as one of the reasons why European countries have been more affected by the financial crisis than the US. The aim is for money - investment and savings - to flow across the EU to the benefit of consumers, investors and businesses, wherever they are. The priority of the EU Commission, which is the priority of a united Europe, is job creation and economic growth. The challenge for Europe's economic recovery is to seize the opportunities to invest in European businesses and infrastructure.

The CMU is closely linked to the very long history of the EU capital market. Freedom of movement of capital was expressed in 1957 with the signing of the Treaty of Rome. In short, in 1988, restrictions on the movement of capital were lifted. Well, already in 1999, the European Economic and Monetary Union prepared an action plan for financial services (Veron, N., Wolff, G. B., 2016). EU CMU also helps to alleviate economic shocks through private channels, supports the international role of the euro and facilitates the diversion of necessary private funding to the transition to a green economy. Together with the Banking Union, the Capital Markets Union can help increase cross-border capital flows and thus strengthen the EU economy. In Commission staff working document (2017) it was found out that EU capital markets are still not yet fully integrated. In some Member States, they are underdeveloped and lag behind certain entities with non-EU jurisdiction. As a result, the EU is becoming heavily dependent on bank financing, businesses, in particular small and medium-

sized enterprises, institutional investors and consumers, have less choice and private risk-sharing is limited. Thus, the reasons for further developing the Capital Markets Union are still relevant.

A study by Schammo P. (2015) showed that the adequacy of the single capital market concept for financing small and medium-sized enterprises. The author says he is behind a pan-European funding platform. It should work in conjunction with an information access system to connect small and medium-sized enterprises with capital providers, including commercial banks. But compared to the rest of the world, European companies remain highly dependent on bank financing and relatively less on capital markets. Stronger capital markets would complement banks as a source of funding and help (EC, 2015):

- increase the stability of the financial system by ensuring a wider range of funding sources.
- attract more investment for all businesses, especially small and medium-sized enterprises (SMEs), and infrastructure projects;
- attract more investment to the EU from the rest of the world;

A large proportion of companies are highly dependent on bank financing, according to the European Central Bank, which provides more than half of all financing. The main challenge for bank funding is that it is characterized by cyclicity, with the economic downturn making it much more difficult for banks to provide sufficient funding for business. The CMU initiative must have a clear set of objectives and definitions in order to launch a constructive political debate. The single capital market consists of three main pillars (AFME, 2014):

- capital market infrastructure.
- issuance of capital market instruments;
- investments in capital markets.

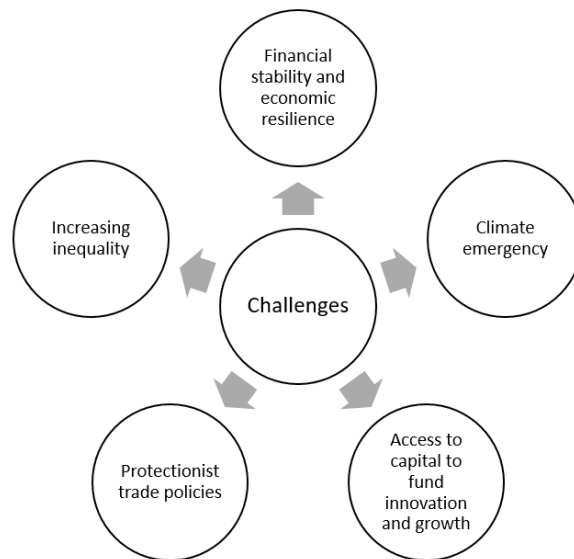
The successful functioning of the Capital Markets Union depends not only on what is happening in Brussels, but also on the Member States. Once the EC has made all the proposals set out in the Action Plan, national authorities have an important role to play, both in the implementation of EC measures and in other initiatives related to the development of capital markets. In addition, some of the issues involved go beyond the regulation of the financial sector and require the involvement of even a number of national authorities. For example, according to the EC, the uncertainty surrounding these different insolvency regimes is one of the main reasons for not investing or establishing business relationships outside your own country. However, this issue also involves national ministries of

justice, so effective interinstitutional cooperation at both national and EU level is essential for real progress towards a single capital market. Given the complex and lengthy process of building a capital markets union, national initiatives to create regional blocs that can then be merged into a single EU capital market are particularly welcome in this context.

1.3 Challenges for an EU Capital Markets Union

Today, Europe is facing new and diverse challenges. Socio-economic models already have to adapt to possible changes in the strategic environment, so it can be said that Europe has reached such a critical junction. The financial services market is necessary for Europe to provide businesses, citizens and society as a whole with the tools to turn these challenges into opportunities. Without a capital markets union, such a financial services market cannot exist. (Interim report of the High Level Forum on the capital markets union - A new vision for Europe's capital markets, 2020).

There was found that in „The European Capital Markets Union: A viable concept and a real goal?“ (2015) book by K.S. Patrick and A. Dombret thought that it is crucial to set realistic, challenging but achievable goals for expanding capital markets. Expectations are only one part, but if we turn expectations into a plan that will be realized in the long run, then capital markets will succeed. The US capital market is a much more popular and long-standing operation than Europe. In principle, there may be a proposal to move the developed and tested US capital market model directly to the EU. However, such an action cannot be taken because the US capital market is very different from the EU capital market. The EU capital market has other specific and unique features that the US and the other do not have. As such an adaptation of the US model is not possible, the EU capital market faces corresponding additional challenges (see Picture 1).



Picture 1. Challenges of the EU CMU

(Compiled by the author, based on Interim report of the High Level Forum on the capital markets union - A new vision for Europe's capital markets, 2020).

We face a variety of challenges every day, but the EU CMU is also trying to address the challenges they face most, which could lead to further development of the initiative. Thus, according to the interim report of the European Commission's (2015) High Level Forum on Capital Markets, the main challenges facing the EU CMU are seven. First, financial stability and economic resilience remain a major concern. From the above information, we know that the US and EU capital markets are very different, and that the EU in particular, both in financial services and in the financial system in general, is dependent on conventional (traditional) bank lending. The consequence is that dependence on traditional banks limits the ability to absorb economic shocks. As a result, Europe's opportunities are diminished by the protection against economic shocks. Another, perhaps unusual and easily unthinkable challenge is the climate emergency. Politicians around the world are debating the climate crisis a lot, it is becoming a priority. Due to insufficient public resources, attempts are being made to focus additional investment on new infrastructure and technological solutions. Thus, without capital markets, it will not be possible to raise public and private resources and investment. In order for the economy to prosper, it also needs adequate funding. However, the lack of access to capital to fund innovation and growth in the regions concerned is often a real challenge for EU businesses, especially small and medium-sized ones. In this case, Europe's productivity growth rate falls as viable start-ups or other start-ups lower their ambitions or even move outside Europe, simply because they face the challenge of finding venture capital. Because the world, like global markets, is

changing really fast, other regions are also striving to be attractive to their investors and gain as much economic weight as possible. Therefore, on a global scale, protectionist trade policies are increasingly testing economic resilience in Europe. Well, another very sensitive challenge is the increase in inequality. It can be seen that not many people in Europe trust and invest in financial products. This is because there is a widespread perception in Europe about the unfair and unfair service of the financial market to citizens. This is causing pension shortfalls because this budgetary and policy challenge is a matter of concern for Member States. In principle, capital markets do not play their role properly and do not yet become a source of additional income for a rapidly aging society.

When analyzing capital markets and financial intermediation, three different perspectives are useful: the perspective of property owners such as savers or investors, the perspective of financial intermediaries, and the perspective of financial demand of corporations, households, and governments. These perspectives are equally important in identifying the policy challenges that the EU faces in promoting the development of capital markets. (Veron N, Wolff G. B. 2016). Thus, in Figure 1 we see a large EU banking sector. From this figure, we can see that the Chinese financial system is smaller than the US or the EU. The bulk of the banking sector's assets here. Well, and U.S. debt securities and stock markets have a lot of influence in financial intermediation. However, if we compare the US with the EU, we will notice that there is still a huge gap between US and EU banking sector assets. The assets of the banking sector still play a crucial role in the EU, while in the US this is not an important aspect. The structure of the Japanese financial system is generally not similar to any of the countries listed above. Japan's financial structure can be said to be between the EU and the US.

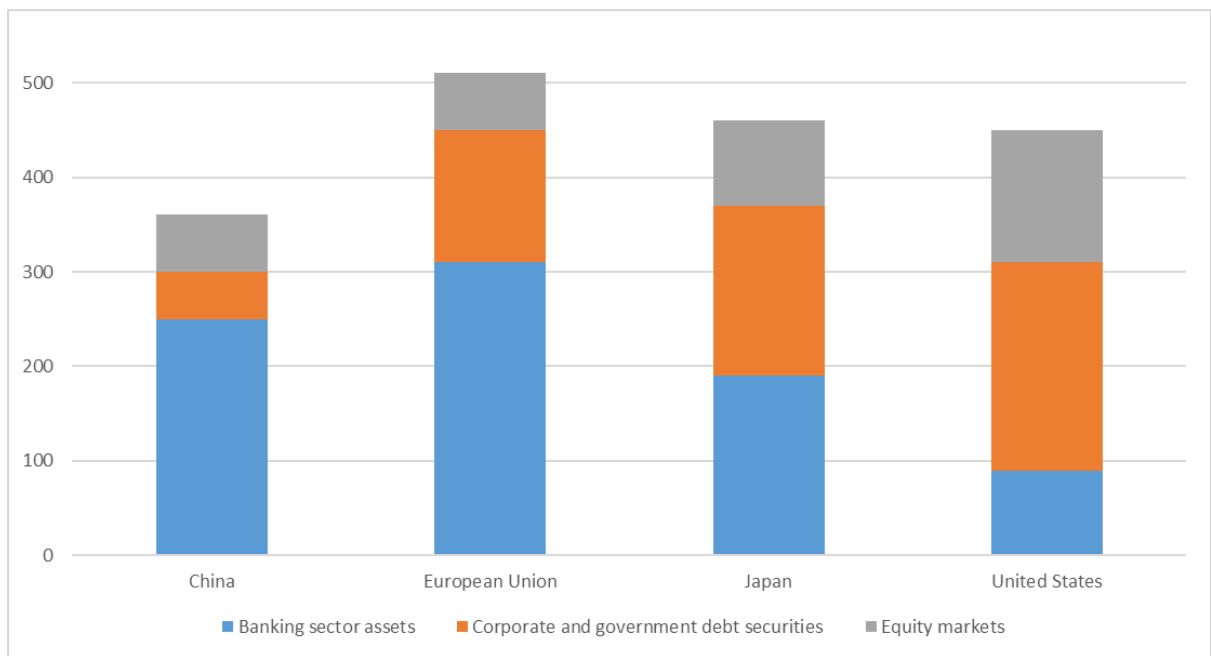


Figure 1. Size of the financial sector and capital markets (percentage of GDP).

(Compiled by the author, based on the Journal of Financial Regulation (2016))

But moreover, one of the challenges is job creation. Young businesses and stratifiers are a key mechanism for job creation. Even during the financial crisis, emerging or established young companies were net job creators, and even higher job growth was driven by fast-growing companies. Therefore, one of the main tasks of the EU is to support and finance such companies. (Menon C., Gal P.N., Criscuolo Ch., 2014).

Challenges are a call to defeat yourself, your fears, a call to choose what is best. The challenges are the test, the difficulty faced by the financial market. All people face certain difficulties, challenges, all people need to look the test in the eye. If no action is taken, Europe could be deprived of the opportunity to avoid a climate crisis, and it could also undermine long-term competitiveness. Addressing the challenges EU CMU can help lift business for future generations and build a better tomorrow. However, the challenges mentioned above are not over. The closure of borders due to the global pandemic, the suspension of cross-border movements and the cancellation of flights have had a severe impact on most sectors. Well, capital markets continue to address emerging challenges. The impact of COVID-19 on the EU CMU will be examined further in the work.

1.4 Political economy background of Capital Markets Union

The Capital Markets Union is the latest in a series of large-scale reform projects in Europe, both financially and economically. This is followed by a series of supposed institutional changes designed to close so called governance gaps resulting from the protracted economic and financial crisis in the euro area (Salines M. et al., 2012; Braun B., 2015; Jones E. et al., 2016). In the areas of banking supervision and macroeconomic governance in particular, it is this reform effort that has mobilized significant supranational powers (Howarth D., Quaglia L., 2016; Scharpf F., 2016; Epstein R., Rhodes M., 2016). While the Capital Markets Union is closely linked to these crisis reform initiatives, it also returns to the long-term ambition of European policymakers: to reshape the European financial system with the image of the United States financial system (Segre C., 1966; Dorn N., 2016). The main objective of the Capital Markets Union is to promote market financing by deepening capital markets and strengthening market banking as it was discussed before in the work.

Such a system, dominated by market-based banking institutions, has failed during the eurozone sovereign debt crisis, which has led to some financial fragmentation along national lines, unseen since the introduction of the single currency (European Central Bank, 2011). The greatest fragmentation was observed in wholesale markets, as they were the most integrated before the crisis. Against this background, capital market union is the most ambitious plan. Thanks to this union, the aim is to achieve the difficult goal, which is still associated with the United States, of creating a single European capital market. Generally speaking, the Capital Markets Union seeks to create the conditions for capital markets to absorb more of citizens' savings, in which case they will play a greater role in financing businesses. To date, the most advanced component of the Capital Markets Union seeks to revitalize the European securitization market, the backbone of shadow banking. (Hardie I. et al., 2013)

The European Central Bank, the Commission and other policy makers clearly see the Capital Markets Union as part of the ongoing troubles in the euro area. This perception is particularly evident when it comes to financial instability and weak economic growth. However, in the wake of the global financial crisis, more specifically in 2008, market-oriented financing was generally seen as part of the problem. In examining the causes of the crisis, economists have highlighted the financial instability that has developed in market banking as a crucial root cause of both the US subprime crisis

and European banking and sovereign crises (Brunnermeier M., 2009; Gorton G., Metrick A., 2012; Gabor D., Ban C., 2016; Adrian T., Shin H., 2010). Political economists have sought new sources of profit in search of new crisis shadow banking, often in conjunction with regulatory arbitrage (Thiemann M., 2014; Goldstein A., Fligstein N., 2017; Thiemann M., Lepoutre J., 2017; Fernandez R., Wigger A., 2016), as well as institutional investors seeking returns and demand for secure assets. (Sweeney R., 2017; Lysandrou P., Nesvetailova A., 2015; Vermeiren M., 2017; Gabor D. 2016a) Given the blame for the crisis on these new forms of financial intermediation, many observers expected a political shift away from financial innovation and shadow banking. At the same time, in the financial field, as in broader economic policy, neoliberal ideas and policies have proved surprisingly resilient. (Blyth M., 2013; Crouch C., 2011; Schmidt V., Thatcher M., 2013; Engelen E., Glasmacher A., 2018; Ban C., 2016; Helleiner E., 2014) Reformist policy innovations such as stress testing, macroprudential regulation, leverage and new liquidity rules, or higher capital requirements, does not manage shadow banking and does not disrupt failing banks. (Gabor D., 2018)

The Capital Markets Union is in the first row of the European Commission's agenda, as it seeks to expand and accelerate the development of market financing in the European Union. In research of explanations for financial resilience in a post-crisis political environment, political scientists explored the role of “financially friendly” economic ideas (Lockwood E., 2015; Braun B., 2014; Widmaier W., 2016; Baker A., 2013; Engelen E. et al., 2011) as well as the instrumental, structural and infrastructural power in the political process (Woll C., 2016; Culpepper P., Reinke R., 2014; Gabor D., 2016b; Braun B., 2018; Pagliari S., Young K., 2016). Important new questions arise because even the literature has not yet reached an agreement with the Capital Markets Union, which can be seen as the culmination of the post-crisis financial resilience of the European market.

1.5 COVID-19 and European Capital Markets Union

When the global economy seemed to be recovered from the past financial crisis and other emerging challenges, we were met by the COVID-19 (coronavirus) pandemic. Its emergence and enforcement action is like a big stone thrown into the relatively calm waters of the European economy (Fernandes N. 2020). The COVID-19 outbreak began in 2019 December in Wuhan, China. Although we survived the first wave of coronavirus, the virus continues to spread around the world. While some countries seem to have coped well with the virus that caused the pandemic, some European countries have struggled to manage the turmoil caused by the first tranche. Some countries no longer allowed

inbound tourists, part of the population had to choose a job from home, part of the people lost their jobs because their businesses and jobs had great contacts with various people, which was forbidden to do so. Economic indicators began to fluctuate and the EU CMU also saw the risks to the capital markets and took some actions.

COVID-19 pandemic for many people has become a challenge and caused the biggest global recession since World War II. Comparing the United States and China with the European Union, it is seen that EU economic performance is projected to be much worse in 2019-2023. It is clear that food services, tourism and other services, have been hit hardest by the increase in morbidity rates. For many European Union countries, the government has provided adequate assistance and financial support, which, however paradoxically, has reduced the number of cases of business insolvency. By Claeys, Darvas, Demertzis and Wolff article „The great COVID-19 divergence: managing a sustainable and equitable recovery in the European Union“ in order to control the pandemic, people divided into several camps, some were dissatisfied with the benefits for those who have been vaccinated, others were unhappy about lost jobs, for not working businesses and so on. This has changed people attitudes towards work, as the vast majority of employers have adapted to working remotely, in the hope that they will attract greater employee involvement, increase productivity and encourage consumers to change their behavior. The speedy recovery of the European Union also requires the involvement of capital markets, which play an important role. In general, the pandemic has caused changes in the medium and long term, not only in the European Union's economy but also worldwide.

The recovery from COVID-19 requires a reform of insolvency processes that could help companies of all sizes to recover. In fact, the empowerment and progress of insolvency proceedings is crucial for effective recovery. Be that as it may, the European Union's systems do not prioritize restructuring but liquidation, and the remaining business value suffers. However, removing the current constraints on the current virus could lead to an even greater wave of insolvencies, and reforming these processes could help overcome the main obstacles to economic growth after COVID-19 (Claeys, Hoffmann and Wolff, 2021). In general, increasing judicial capacity (easing penalties for business failure) and simplifying procedures (strengthening market selection) can be very helpful in helping companies enter or exit the market (Adalet, Andrews and Millot, 2017, Peng, Yamakawa and Lee, 2010).

The aim of the Restructuring and Second Chance Directive (Directive (EU) 2019/1023) is to adapt targeted measures and increase efficiency in insolvency proceedings in the European Union.

Thus, at European Union level, policy-makers should strive for the rapid transposition and proper application of national legislation. In principle, these would be effective tools for promoting economic growth, innovation, investment and, most importantly, extremely useful steps towards a capital markets union.

In stimulating the economy, the government is trying to maintain stable growth challenges, but in order to reach the target level of GDP, consumer and business capital expenditures may pose corresponding challenges. In Figure 3, we can see the annual decline in stock markets by selected countries. UK and Spanish stock market performance fell sharply. We can assume that the UK stock market may have been affected by Brexit as well. However, when we know how hard Spain has been hit by the pandemic, it is clear that COVID-19 has also hit the country's stock market hard. The German stock market was also significantly affected by the coronavirus pandemic (Fernandes N. 2020).

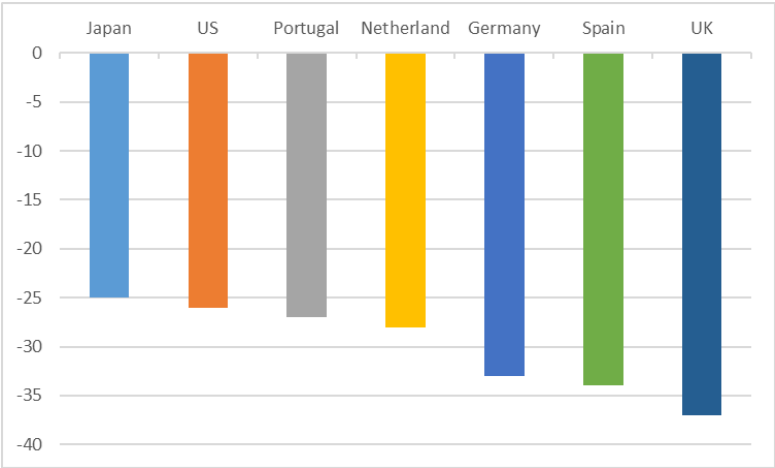


Figure 2. The performance of Global stock markets in 2020.

(Compiled by the author, based on Reuters Eikon)

Financial systems of emerging European economies are far less advanced than those of the more developed countries of the European Union, which is why some of the capital markets are lagging behind. The activities of financial market participants have contributed to the global financial crisis. As various financial institutions collapsed during the crisis, a different approach to capital market business practices and regulatory measures was followed, leading to a change in the number of financial institutions. Moreover, the financial crisis caused by COVID-19, which hit the financial system, only showed that, although banks' capital base and funding gap is stronger. Gennerally, the

capital base and funding structure of banks were not enough sufficiently equipped to deal with shocks in the event of another crisis.

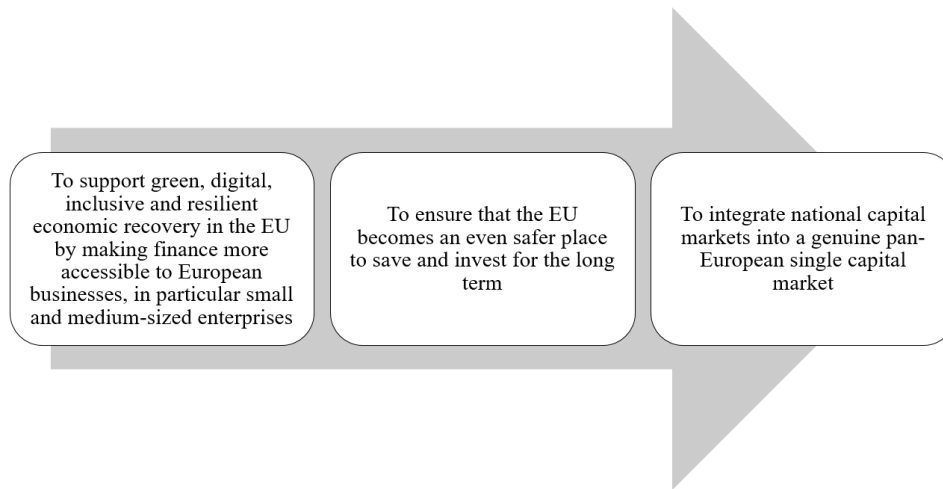
According to the literature and the generally accepted opinion, the financial sector played a crucial role in promoting the economic growth of countries before the global financial crisis (Levine, 1997). In the political and academic literature, the need for macro-prudential regulation and systemic risk in the financial sector only became commonplace in the late 1990s. The global financial crisis has led to the shift from securities to secondary borrowing and the emergence of a shadow banking system. In Europe, a vicious circle has emerged over failed financial institutions, between banks and their sovereign problems. Because of them, governments in various countries had to spend more public money to rescue the financial industry. Funding for the private sector, which promotes the smooth running of the economy, was also an obvious problem. In general, the riskiness, role and need for regulatory reform of financial institutions and markets are defined as the reform of the financial sector in the wake of the global financial crisis. Therefore, the actions taken during the global financial crisis have provoked various lessons (Acharya, Richardson et al., 2009; Admati, Hellwig, 2013).

There are two main reasons for the regulatory changes in the capital market following the global crisis. The first and almost the most prominent reason is the creation of the Capital Markets Union / initiative, which has expressed the need to improve the integration of European capital markets (European Commission, 2015). The second reason is the lessons learned above, which have led to market infrastructure, consumer protection and prudential reform. As the European Union and the global financial crisis in general developed, markets did not function properly. Due to the rating agencies of the time, the risks in the financial markets were assessed incorrectly. According to the EU's assessment of the causes of the global financial crisis (de Larosière Report, 2009), three key issues are identified as interlinked and contributing to the crisis as a failure to regulate capital markets. The first would be the aforementioned underestimation of credit risk from credit rating agencies. The second and no less important problem is that structured finance products are complex. The third is the emergence of a shadow banking system.

An important review of the various literature is highlighted in the journal *Emerging European Economies After the Pandemic* (Matyas, 2021). The section on regulatory and institutional changes in capital markets post-crisis states that in the aftermath of the global financial crisis, the way financial institutions should manage their positions, not the product itself, should have been regulated. On the same day as the first Capital Markets Union Action Plan in 2015, a comprehensive securitization

regulation was announced. This Regulation entered into force in January 2019 and sets out the main criteria for the amendment. The key benefits of this change have been that a standardized and transparent securitization status can increase market liquidity and investor confidence. Second, the preferential market ratio is based on the cash reserve ratio, making it cheaper for investment firms and banks to hold transparent and standardized securitization positions. However, as securitization is very limited in emerging European economies, the regulation itself has a limited impact on these markets.

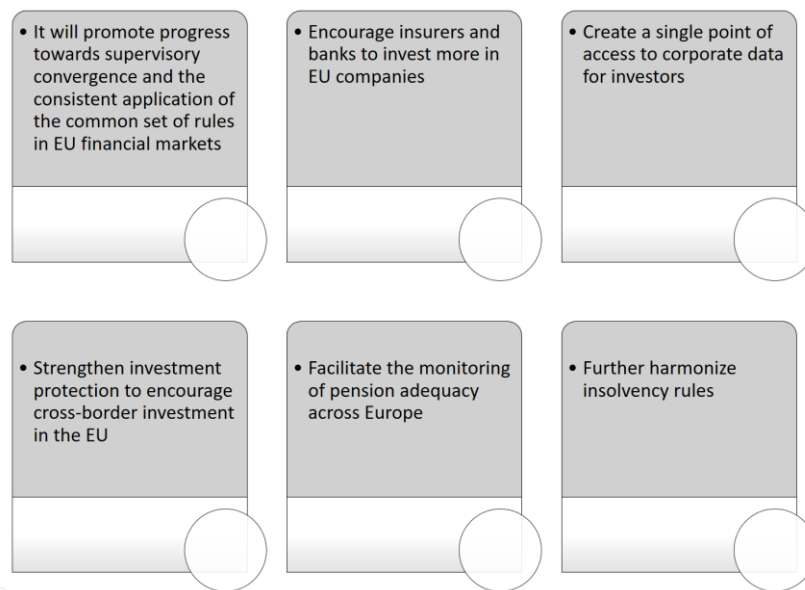
The European Commission has announced a new and ambitious action plan to strengthen the European Union's CMU in the coming years. Today, the EU's top priority is to ensure that Europe recovers from the unprecedented economic crisis caused by Covid-19. This requires the development of EU capital markets and access to market finance, as well as immediate support for economic recovery by facilitating EU companies. Access to finance, especially for small and medium-sized enterprises, the negotiations on the so-called Capital Markets Recovery Package have been identified as one of the top priorities in the Council and in the negotiations with the EU legislators. Large and integrated capital markets will facilitate the recovery of the EU economy and ensure that businesses, especially small and medium-sized enterprises, have access to sources of finance and capital and that savers in Europe do not lack the confidence to invest in their future. Vibrant capital markets will also contribute to Europe's green and digital transformation, as well as to a more inclusive and resilient economy. The Capital Markets Union is also crucial in strengthening the international role of the euro. European Commission issued a communication „Capital markets union new action plan: A capital market union for people and businesses“ and there reported about action plan which has three main objectives (see Picture 2).



Picture 2. CMU action plan objectives.

(Compiled by the author based on EC, 2020)

The Commission is therefore proposing sixteen targeted measures to make real progress towards completing the CMU. The measures announced today in the EU:



Picture 3. Incentives for CMU.

(Compiled by the author based on European Commission, 2020)

“To ensure a rapid and sustainable economic recovery from the COVID-19 crisis, we need to encourage public and private investment. A set of measures to revitalize capital markets will be very useful for this purpose. This package facilitates capital markets to support economic recovery. It will facilitate the recapitalization of companies, support bank lending and encourage investment

in the economy, while maintaining a high level of investor protection.” – said German federal minister of finance and vice-chancellor Olaf Scholz.

Part of the amendments to the MiFID II rules agreed by Council and Parliament purposefully simplify the requirements for the provision of information, for example on expenditure and taxes. These changes will facilitate the provision of investment services and investment in the EU economy without compromising investor protection. In addition, a targeted exemption has been agreed to allow banks and financial companies to combine research and enforcement costs in the case of research on small and mid-cap issuers. This will increase the coverage of research by such issuers, thus improving their access to finance in the capital markets. In order to help European companies respond to market volatility and to support the emergence and growth of euro-denominated commodity derivatives markets, the exposure limit requirements for commodity derivatives will be adjusted accordingly. These changes do not affect agricultural products, in particular products intended for human consumption.

EU legislators have also agreed to introduce a new, shorter EU recovery prospectus to make it easier for companies to spend capital. The EU Recovery Prospectus will be available to increase capital to 150% of outstanding capital liabilities over a 12-month period. This will avoid issues that significantly reduce receivables, while ensuring that the new prospectus can be used for significant recapitalizations of companies. The new regime will apply until 2022 to enable issuers to raise the additional own funds needed to overcome the COVID-19 crisis. During the negotiations, the Council and Parliament also clarified the requirements for the minimum information to be included in the recovery prospectus in order to provide adequate information to investors.

To facilitate securitization, the existing EU system of simple, transparent and standardized securitization is being extended to include synthetic securitization. Synthetic securitization is an important credit risk management tool for banks, enabling them to transfer the risk of a particular group of loans (usually large loans to companies or loans to small and medium-sized enterprises) to investors. The agreed changes will free up bank capital for further lending and allow a wider range of investors to finance the economic recovery from the COVID-19 crisis. In order to promote the use of a simple, transparent and standardized label, preferential risk weights are set for the higher priority segments held by the originator, and the European Banking Authority will closely monitor the market for such products to ensure that banks are not exposed to excessive leverage. The new rules also remove regulatory barriers to the securitization of non-performing positions. This has

been done in principle by aligning the rules for non-performing positions with international standards and ensuring their prudential soundness, while allowing originator banks to use more risk-taking modeling practices. This will help banks to better manage their balance sheets in response to the economic consequences of the COVID-19 pandemic, ensure their medium-term lending capacity and increase risk-sharing with the non-bank financial sector.

2. COVID-19 IMPACT TO EUROPEAN CAPITAL MARKETS UNION

After analyzing the concepts of the capital markets, European Union Capital Markets Union, European Commission's action plan for the creation of a single capital markets union in the first chapter, the author assumed that the coronavirus pandemic affects the European Union capital markets. For this reason, it is necessary to assess the current capital market in the European Union and to analyze whether the number of new cases of the coronavirus pandemic is affecting the volatility of capital markets. A modern statistical method will be used to identify the current situation and potential impact on the capital markets, which is described as the science of collecting, systematising, analyzing and interpreting information.

2.1 Research methodology

After reviewing and analyzing the sources of scientific and journalistic literature, the author of this work assumes that the COVID-19 virus, which has spread all over the world, has led to corresponding changes in the European Union capital markets and will also affect the European financial market in the future. To justify this, further work will analyze the impact of COVID-19 on the European capital markets, specifically - debt securities market and equity securities market, at a common European level. Because of COVID-19, the world has reached an economic crisis. The countries of the European Union have suffered no less than the United States or the Middle East countries. Therefore, the aim of this work is to prove and demonstrate that the numbers of new cases during a coronavirus pandemic has an impact on European capital markets fluctuations (growth or decreases).

In order to assess the current situation and the potential impact on the EU capital markets, as mentioned before, a modern statistical approach will be used to conclusions. The methodology of this work is divided into three parts (see Table 1): data collection, data presentation and conclusions.

Table 1. Stages of the research (compiled by the author).

Stages	Steps
Data collection	1. European Union capital market analysis
	2. Determining the number of stock exchanges in EU countries
	3. Federation of European Securities Exchanges descriptive analysis
	4. European Union stock exchange capitalization information collection and systemization.
	5. Public listed companies on European Union stock exchanges information collection and systemization.
	6. Turnover on bonds, derivatives, ETF's and stocks on European Union stock exchanges information collection and processing
Data systematization and analysis	1. Descriptive statistics
	2. Application of correlation between turnover on bonds, derivatives, ETF's, stocks and COVID-19 virus caused new cases
	3. Application of pairwise regression between turnover on bonds, derivatives, ETF's, stocks and COVID-19 virus caused new cases
	4. Determining the impact of COVID-19 virus on European Union capital markets
Conclusions	1. Summary of the obtained results

Secondary data will be used for data collection - statistics on the European Union stock exchanges of the European Stock Exchange Federation (FESE) and other global organizations. Also, in this work the author will analyze the current capitalization of the European Union stock exchanges, the number of stock companies, the turnover of bonds and shares and other derivatives. With the help of this data, it will be possible to analyze the data of the European Union countries and compare them with each other. In the data processing stage, the author of the work will perform descriptive statistics and perform correlation and regression analysis to achieve the goal of the final work by presenting conclusions.

As stock exchange trading is standardized and information on transactions is more easily accessible, it can be said that a larger share of the capital market is concentrated on stock exchanges. After analyzing the stock exchanges of the European Union countries, the indicators were selected for the research to help to compare the stock exchanges with each other, which will help to describe the size of the stock exchanges and their share in comparison with other European Union countries.

The main data source for further analysis was FESE. First, the members of the European Union stock exchanges were identified on the basis of FESE data. Also, the author of the paper used the Statista database, in which the data was the most recent, January 2021, to determine the largest stock exchanges. Later, when the analysis of further challenges was started, the information was taken from FESE again. This information was collected from 2001 to 2021. Several time periods were selected for the analysis: 2001-2021 to review year-to-year trends, then 2001-2006 (derived average of relevant number before the financial crisis period), 2007-2008 (derived average of relevant numbers during the financial crisis period), 2009-2019 (derived from the relevant numbers after the financial crisis / recovery period) and 2020-2021 (derived from the average of the relevant numbers during the coronavirus pandemic period). It is important to mention that although 2021 is over, FESE has not already provided the figures needed for the analysis, so the 2021 data are without 2021 December figures. It is also important to mention that the United Kingdom has been removed from the calculations because, after Brexit, it no longer belongs to the European Union.

After collecting all the data it became scientific information, which can be compared to reveal trends. In order for these processed data to have value, descriptive statistics are used for them. And this process includes methods of data systematization and graphical representation. A detailed description of the collected information and data graphs allow conclusions to be drawn about the characteristics of the figures under consideration. After gathering all the necessary information, everything was processed using MS Office Excel Pivot, CORREL, Regression functions and graphs / tables were formed from the systematized information.

2.2 Correlation and regression analysis methods

Correlation analysis is one of the types of analysis used to evaluate the statistical relationship between two variables. In many tasks where quantitative indicators of ongoing processes are used, it

is important how they interact with each other. Relationships between variables may be suspected or it can actually exist. Correlation analysis allows to determine whether there is a connection between the analyzed factors, expressed in quantitative indicators (Pabedinskaitė, A., Paliulis, N., Šaulinskas, L. 2007).

Using the method of correlation analysis, the correlation coefficient r_{xy} is determined, which indicates whether there is a dependence of the variables and the direction of the relationship between them. The range of variability of the correlation coefficient is from -1 to +1. The closer it is to 1, the closer the relationship between the variables, and the closer the correlation coefficient approaches 0, the weaker the relationship. If the coefficient is positive, it can be said that the relationships between the variables in question are direct, and if, on the contrary, negative, they are inverse. In further work correlation analysis is calculated using MS Office Excel CORREL function where first quantitative set of independent variables and set of dependent variables were identified.

As this study will involve a large sample of data, there are appropriate rules for determining which correlation is considered weak and which is very strong (see Table 2):

Table 2. Interpretation of correlation coefficient value.

Correlation coefficient	Interpretation
From 0,9 to 1,0 or from -0,9 to -1,0	Very strong correlation
From 0,7 to 0,9 or from -0,7 to -0,9	Strong correlation
From 0,5 to 0,7 or from -0,5 to -0,7	Mean correlation
From 0,3 to 0,5 or from -0,3 to -0,5	Weak correlation
From 0,3 to -0,3	Correlation is insignificant

(Compiled by the author. Source: Valkauskas, R., 2011)

Regression analysis is the type of statistical method which helps to determine the mathematical expression of dependencies between random variables and parameters analysis. When relationships are determined with correlation method, regression model can be used to determine further expectations. All regression predictions are quantitative. In regression analysis there is always a question, how one kind of the numerical values of one variable are dependent of the other numerical values of second variable. Shortly, how values of the variable Y are dependent of the values of X.

Regression analysis allows to predict the value of variable from the values of another variable (Čekanavičius V., Murauskas S., 2003).

The most important advantage of regression analysis is that the function that binds the variables is selected and it is used to find the relationship between X and Y in the form of a line, that is, the regression curve. Regression curve can be expressed by the formula: $y=a+b_1X_1+b_2X_2+b_3X_3+\varepsilon$. The coefficient in this equation at x shows how much the dependent factor will increase when the independent increases by one unit (Pabedinskaitė, A., Paliulis, N., Šaulinskas, L 2007).

The whole regression analysis can be divided into 3 main parts:

1. Selection of variables, application of regression formula and calculations of the coefficients (construction of the model).

2. Checking suitability of the data for the model, data suitability for the model, model future assumptions (structure of the model). If the changes are needed, the model should be improved.

3. When model do not occur any errors, it can be used for the descriptive analysis and predictions.

In this paperwork for the regression analysis R square value will be taken. The range of variability of the regression R square value is from 0 to +1, which means that the bigger value is to +1, the bigger influence it has. In further work regression analysis is calculated using MS Office Excel → Data → Data Analysis → Regression data analytical tool, where input Y range are monthly values of the European Union capital markets bonds, derivatives, ETF's and stocks and input X range are monthly collected cases of COVID-19 infected humans.

In conclusion, it is believed that the developed methodology will help to achieve the goal of the work and provide an opportunity to analyze the impact of COVID-19 virus to European Union capital markets.

3. STUDY OF THE IMPACT OF COVID-19 ON THE EU CAPITAL MARKETS UNION

One of the key objectives of the European Union's Capital Markets Union is to improve access to finance for all businesses, especially for small and medium-sized enterprises, which are said to be a key driver of growth and creating new jobs. In 2017, according to Eurostat, the vast majority (99.8%) in the EU were small and medium-sized enterprises. For comparison, large enterprises have only 0,2% of all enterprises in the EU. In the wake of the coronavirus pandemic, small and medium-sized enterprises in the Eurozone reported that they were having difficulty finding customers, a major concern for their business. However, it is interesting to note that even during the pandemic, access to finance was seen as the least important barrier. Difficulties in finding customers were considered to be a major concern for small and medium-sized enterprises in the euro area, accounting for 22%. Also, there is a shortage of skilled labor (19%). However, over time, concerns about funding opportunities have increased in many countries. However, the lack of access to finance continued to have a significant impact on small and medium-sized enterprises in Greece (22%) and Italy (14%), but remained among the lowest barriers in the euro area (10%). Due to the increased reliance on bank lending, the European economy is sensitive to tightening bank lending conditions, such as the financial crisis.

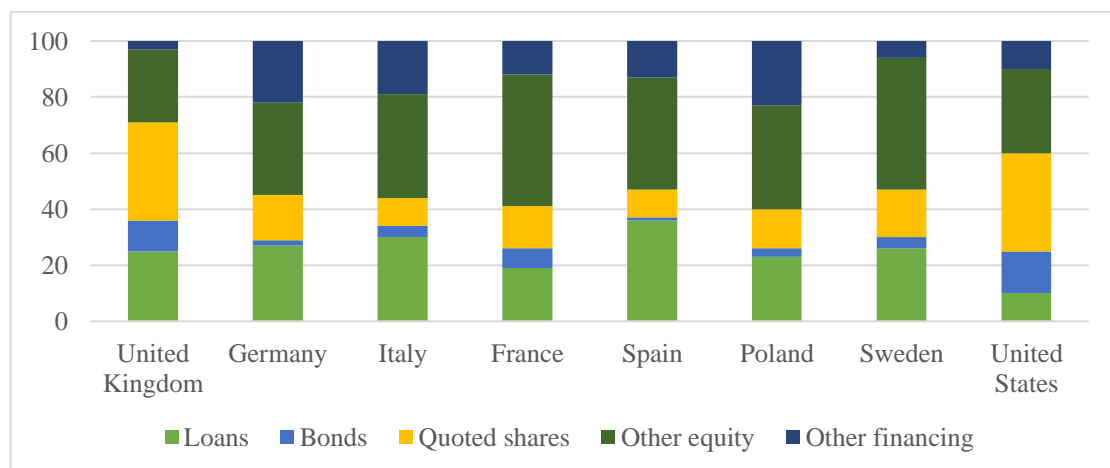


Figure 3. Funding models of the 7 EU Member States and the US.

(Compiled by the author, based on Eurostat, OECD data).

Figure 3 shows the funding models of the 7 EU Member States and the US, which differ from country to country. The financing of companies in the US capital market by the European Commission is a model that it seeks to achieve. And even the best-performing national markets in the European Union (Germany, France) are not large enough to form a critical mass, resulting in a smaller investor base and fewer financial instruments on offer. As a result, the share of European Union securities remains as low as might be expected in a fully integrated market. Figure 3 shows that the UK stands out from other European countries and most similarly to the US capital market.

3.1 Federation of European Securities Exchanges descriptive analysis

Federation of European Securities Exchanges (FESE) represents 35 exchanges where stocks, bonds and derivatives are traded. Federation of European Securities Exchanges consists of 18 full members (Athens Stock Exchange, Boerse Stuttgart, Deutsche Börse AG, Bolsas y Mercados Españoles (BME) incorporating, Bucharest Stock Exchange, Budapest Stock Exchange, Bulgarian Stock Exchange, Cyprus Stock Exchange, Euronext incorporating, ICE Futures, London Metal Exchange, Luxembourg Stock Exchange, Malta Stock Exchange, NASDAQ Nordics, NASDAQ Baltics, SIX Swiss Exchange, Warsaw Stock Exchange, Wiener Börse incorporating) from 30 countries, as well as 1 partner member (Tel-Aviv Stock Exchange) and 1 observer member (Moscow Exchange). Any of these organizations can be a member of the EU, the European Economic Area (EEA) and Switzerland. Partner Member - an exchange that is not a member of the EU and has not applied to be a member and is not a member of the European Free Trade Association (EFTA). And an observer member who has a specific interest in EU markets but is not a full member.

Federation of European Securities Exchanges seeks to protect and defend the internal market, and as a result, many members of the federation have become integral exchange intermediaries with the opportunity to invest in multiple communities. It can be said that this is an important first step towards unifying the EU's capital markets. Federation of European Securities Exchanges represents public regulated markets. Public regulated markets provide services to both institutional and retail investors, and all activities must be transparent. Securities are listed on Federation of European Securities Exchanges markets and must comply with strict initial and ongoing disclosure requirements, accounting and auditing standards, and established European Union legislation. Also Federation of European Securities Exchanges distinguishes three main principles that guide its activities: first of all it provides a forum for open and forward-looking discussions on capital markets,

secondly it promotes public interest and recognition of stock exchanges and their contribution to the European and global economy and last but not least is that Federation of European Securities Exchanges seeks to promote global competitiveness on European stock exchanges.

As this federation operates globally, through its members, Federation of European Securities Exchanges has links with regulatory communities and industries around the world and works closely with the European Association of Central Counterparty Clearing Houses and the European Central Securities Depositories Association. In particular, they turn to these institutions to resolve problems related to clearing and settlement. The European Stock Exchange Federation also has many partners in Europe, including the European Commission, the European Parliament, the Economic and Financial Affairs Council, the European Securities Committee and the European Securities Markets Authority. It also cooperates with the international organizations CFTC, SEC and IOSCO. All these institutions mediate closely, help to solve the problems that have arisen, and make the right decisions for Federation of European Securities Exchanges.

As a trade association, Federation of European Securities Exchanges is characterized by adherence to strict principles and objective and representative information. As a result, the EC has included the federation in the Register of Stakeholders. It should be noted that Federation of European Securities Exchanges cooperates with organizations around the world, including the World Federation of Exchanges. The main advantage of the European Stock Exchange Federation is that it has the largest database on European securities, as each member of the federation is required to report on a monthly basis the exchange, analysis and cross-border analysis of its stock exchanges, bonds and derivatives.

3.2 European Union stock exchange capitalization and the number of public listed companies on European Union stock exchanges

Each European country has its own stock exchanges, but there are five with a market capitalization of over one trillion US dollars, these markets are considered as major ones. Even in a global context, two of the world's ten largest stock markets are also from European stock exchanges. "Euronext" is the largest stock exchange, connecting the markets of five countries (see figure 4). So basically in Europe, the largest stock exchange is called "Euronext", with a market capitalization of

as much as 4,884.08 billion dollars (see figure 4). However, it is important to mention that the total market capital on this stock market has decreased over the period 2019-2020. Well, in terms of market capitalization, lets single out one of the largest companies – “LVMH Moët Hennessy Louis Vuitton”, which reached its peak on December 31, 2020 with its luxury goods. In summary, the Euronext stock exchange is the seventh largest in the world.

However, another very important stock exchange is the London Stock Exchange. The second largest in Europe is the London Stock Exchange, which stands lower than Euronext and is in the eighth place of the largest stock exchange in the world. Its market capitalization reaches 3,669.69 billion dollars (see figure 4).

Moreover, other stock exchanges under market capitalization still have to make an effort to reach a peak as “Euronext” or even better. Third and fifth place shares Deutsche Börse AG (Germany), Nasdaq (Nordics: Sweden, Denmark, Finland, Iceland and Baltics: Latvia, Estonia, Lithuania, Armenia) and SIX Swiss Exchange (Switzerland). The market capitalization of these stock exchanges ranges between 1,757.32 to 2059.25 billion dollars. Well, the two smallest stock exchanges by market capitalization are the Moscow Exchange (805.31 billion dollars) and the BME Spanish Exchanges (663.63 billion dollars) (see figure 4).

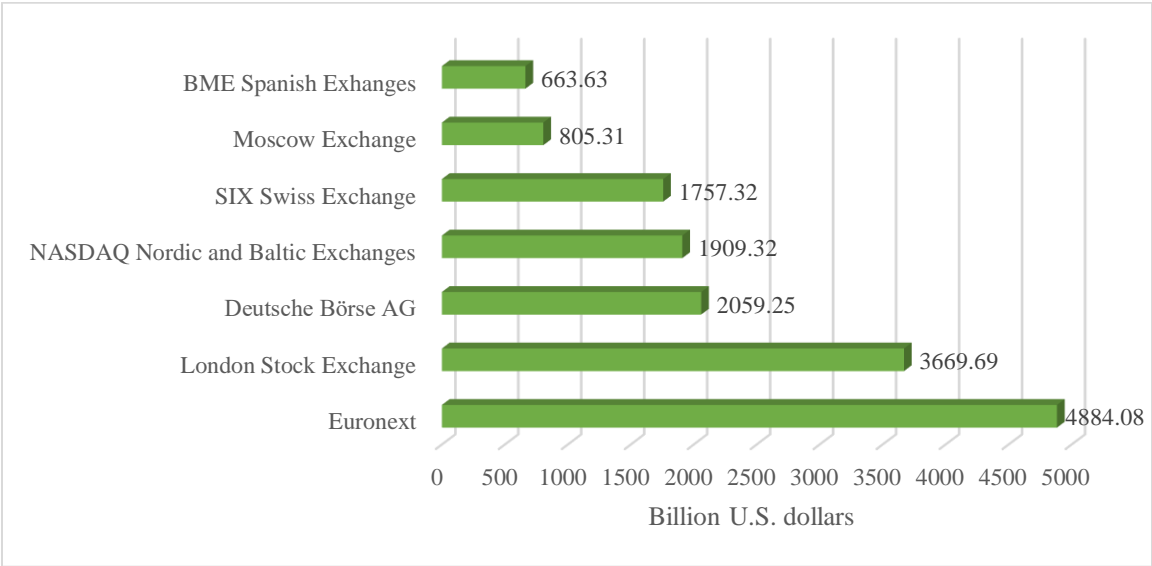


Figure 4. Largest stock exchanges in Europe as of January 2021, by domestic market capitalization (in billion U.S. dollars).

(Compiled by the author based on Statista provided data)

However, for wanted analysis, it is not enough just to look at the largest stock exchanges even if there is given the newest data. For this reason, I will continue to examine data from individual stock exchanges during pre-crisis period of 2001-2006, the economic crisis period of 2007-2008, the recovery period of 2009-2019, and the period of the coronavirus pandemic of 2020-2021. The analysis calculated the capitalization amounts of all the companies included in the FESE members in question, i.e. ordinary or preferred shares of domestic and foreign joint stock companies which do not belong to any other stock exchange.

Capitalization ratio is the indicator which measures financial health of a company and the size of debt in its capital structure. After analyzing the market capitalization indicators (see figure 5) it is seem that the ratio tends to be fluctuating no matter it is a financial crisis or the pre/post crisis period. Author notes, that dynamics of the capitalization ratio during 2001-2021 period experiences significant changes. Already in 2001 a strong market fell in 2002 because of the issues. However, since 2002 started to grow and grow steadily, and in 2007 which meant at that time – crisis begin. Market capitalization ratio started to fall and in 2008 reached its one of the lowest point, when the total capitalization was only 5,641,740 million euros. Such a sharp decline was triggered by the global financial crisis, which has eroded investor confidence and reduced the single market. Besides of that market capitalization indicators started to grow with some fluctuations since 2018. Now, the author assumes, that the situation is probably tending to repeat, which is caused by the coronavirus pandemic.

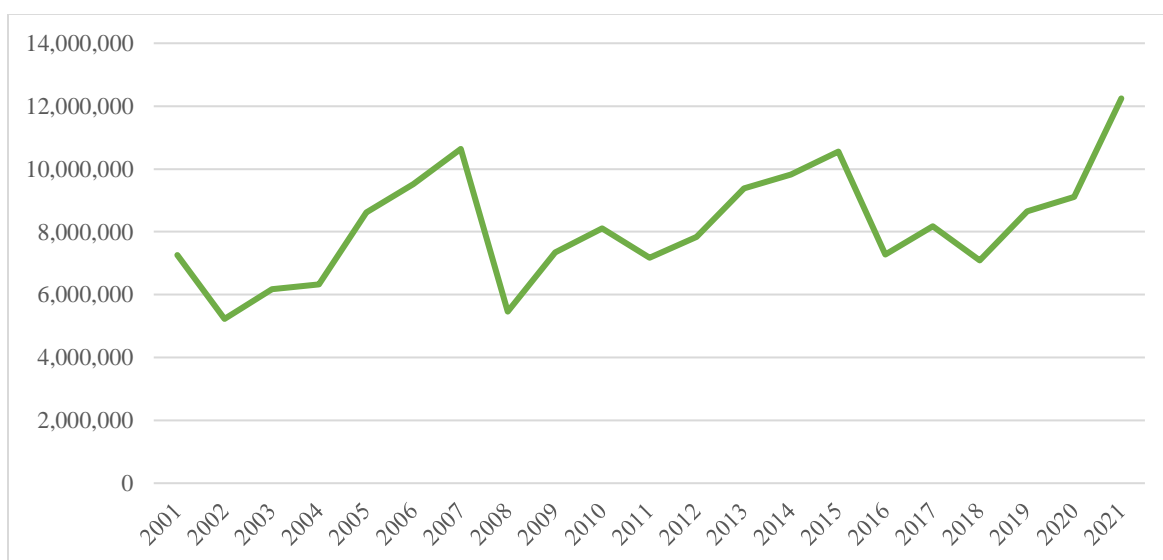


Figure 5. Dynamics of the capitalization ratio of the stock exchanges of the European Union member states in the period of 2001-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Moreover, at the stock market capitalization ratios in figure 6, shows the average capitalization over two periods: before the financial crisis period in 2001-2006 and post-crisis recovery period in 2009-2019. Before the crisis, author single out some of the strongest economic markets: Euronext the London Stock Exchange and Deutsche Borse. From figure 6, it is seen that Euronext and Deutsche Borse, although affected by capitalization during the crisis, have managed to recover and grow, because the economic stimulus policy pursued by the European Commission helped a lot. Unfortunately, during the recovery period, the London Stock Exchange ratios decreased. Also, Poland should be singled out, as the only one that has managed to remain unaffected by the financial downturn and conversely to maintain economic stability. These stock exchange capitalization ratios more than doubled during the periods under review and had a great success for its economy.

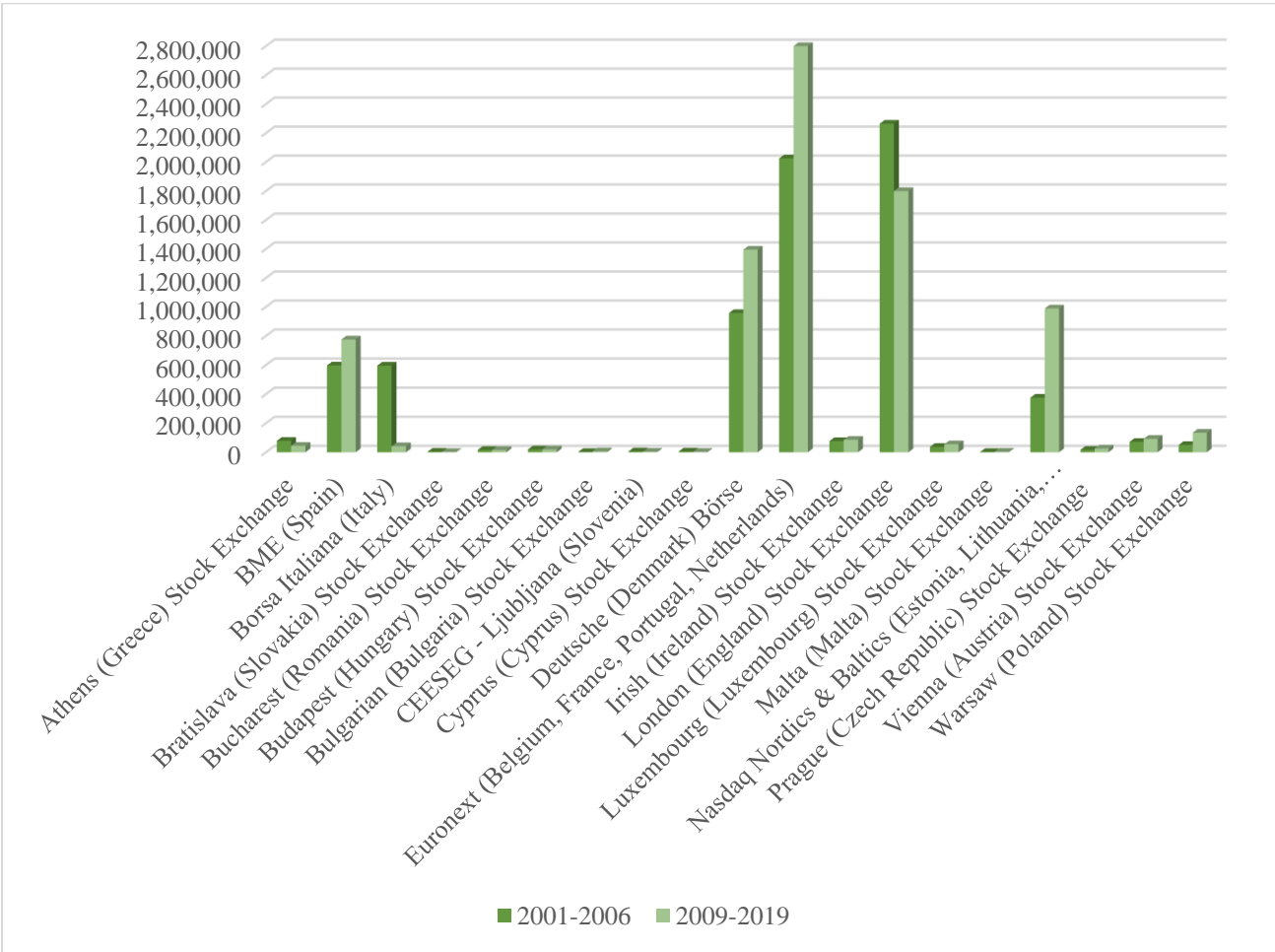


Figure 6. Average stock market capitalization ratio of European Union stock exchanges in 2001-2006 and 2009-2019, mln. EUR.

(Compiled by the author based on FESE data)

Looking at the stock market capitalization ratios in figure 7, which shows the average capitalization over two periods: the financial crisis period in 2007-2008 and the period of economic crisis period caused by the coronavirus pandemic 2020-2021. The strongest economic markets during the financial crisis remained: Euronext, London Stock Exchange, Deutsche Borse, BME (Spanish Exchange) and NASDAQ Nordics and Baltics. The average capitalization ratio of Euronext stock exchanges was the highest during the crisis, reaching 2,198,368 million dollars. However, author notes that it is important to know that Euronext is still growing during a coronavirus pandemic. Now comparing Euronext with the financial and economic crises, author say that their rates have risen by as much as 61 percent. Also, comparing the two crises and two other stock exchanges, namely Deutsche Borse and NASDAQ Nordics and Baltics - they also grew rapidly. From figure 7, it can be seen that the strongest economic markets remain unchanged, with some only growing stronger and others decrease slightly.

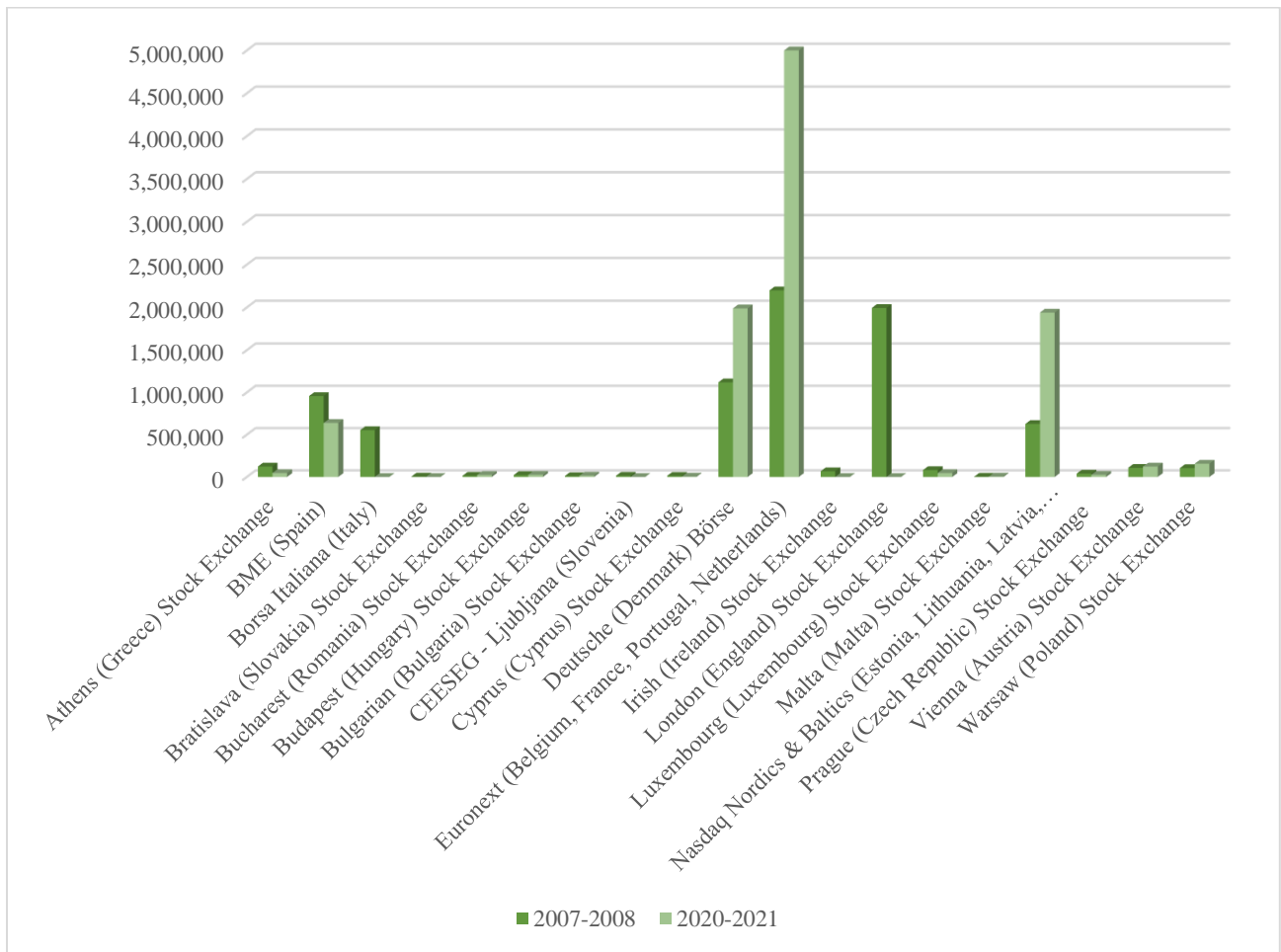


Figure 7. Average stock market capitalization ratio of European Union stock exchanges in 2007-2008 and 2020-2021, mln. EUR.

(Compiled by the author based on FESE data)

An analysis of the overall picture of European Union market capitalization shows that some securities markets are strong enough and recovering, and that some markets still need to strengthen as they have not yet achieved even before the crisis. However, an analysis of the capitalization data of individual European Union stock exchanges reveals a different situation, with the most vulnerable stock exchanges being small, whose capitalization has remained declining or growing slightly, while the capitalization ratios of large stock exchanges are mostly increasing.

When examining the number of public listed companies on the European Union stock exchanges (see figure 8), a slightly different trend should be noted than in the market capitalization analysis. The larger the number of stock companies are, the more reliable investor can feel. This means that only shares issued by public listed companies can be quoted in stock exchanges and the number of public listed companies determines the possibility for investors to distribute risk as efficiently as possible. During the period under review, until 2007, a steady growth trend was observed, which means that the number of stock companies increased with small fluctuations. Well, in 2008 there were 8.681 million stock companies in the capital markets, after which - a steady downward trend began and only in 2017 the attraction and growth of new stock companies is seen. However, the author of the work notes that the result of 2008 has not been achieved yet, although more than 10 years have passed.

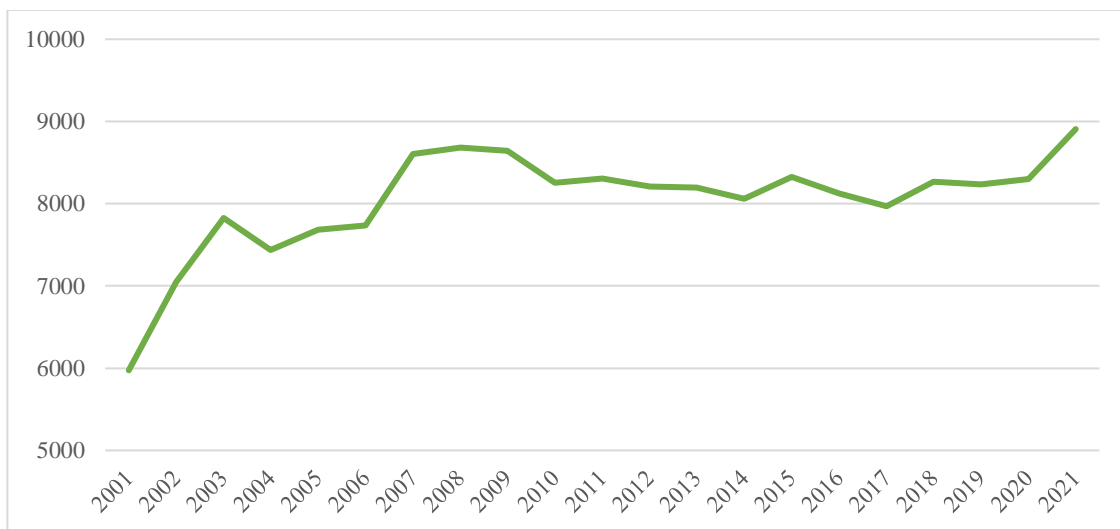


Figure 8. Dynamics of the number of stock companies listed on the stock exchanges of the European Union member states in 2001-2021 period.

(Compiled by the author based on FESE data)

After a more detailed analysis of the number of public companies for each stock exchange (see figure 9), the European stock exchanges with the largest companies were identified during the whole period under review, those are BME (Spanish Exchange), Euronext, Nasdaq Nordics & Baltics and Warsaw Stock Exchange which differed significantly from other stock exchanges. It is seen that biggest list of the number of public companies had BME (Spanish Exchange). Least companies was in the Malta Stock Exchange during the whole 2001-2021 period there were only 81 listed company. A comparison of different periods also showed that the number of companies on seven stock exchanges (Vienna Stock Exchange, Prague Stock Exchange, Malta Stock Exchange, Nasdaq Nordics & Baltics, Euronext, Cyprus Stock Exchange, Bucharest Stock Exchange) fell precisely after the onset of the economic crisis in 2007-2008 (see figure 9),. The pre-crisis numbers is not reached by countries even now. Well stock exchanges, which before the economic crisis (2001-2006) did not had a large number of companies, just grew enough in later periods. The author of the paper notes that the numbers of BME (Spanish Exchange) in particular jumped upwards when the economic crisis started in 2007.

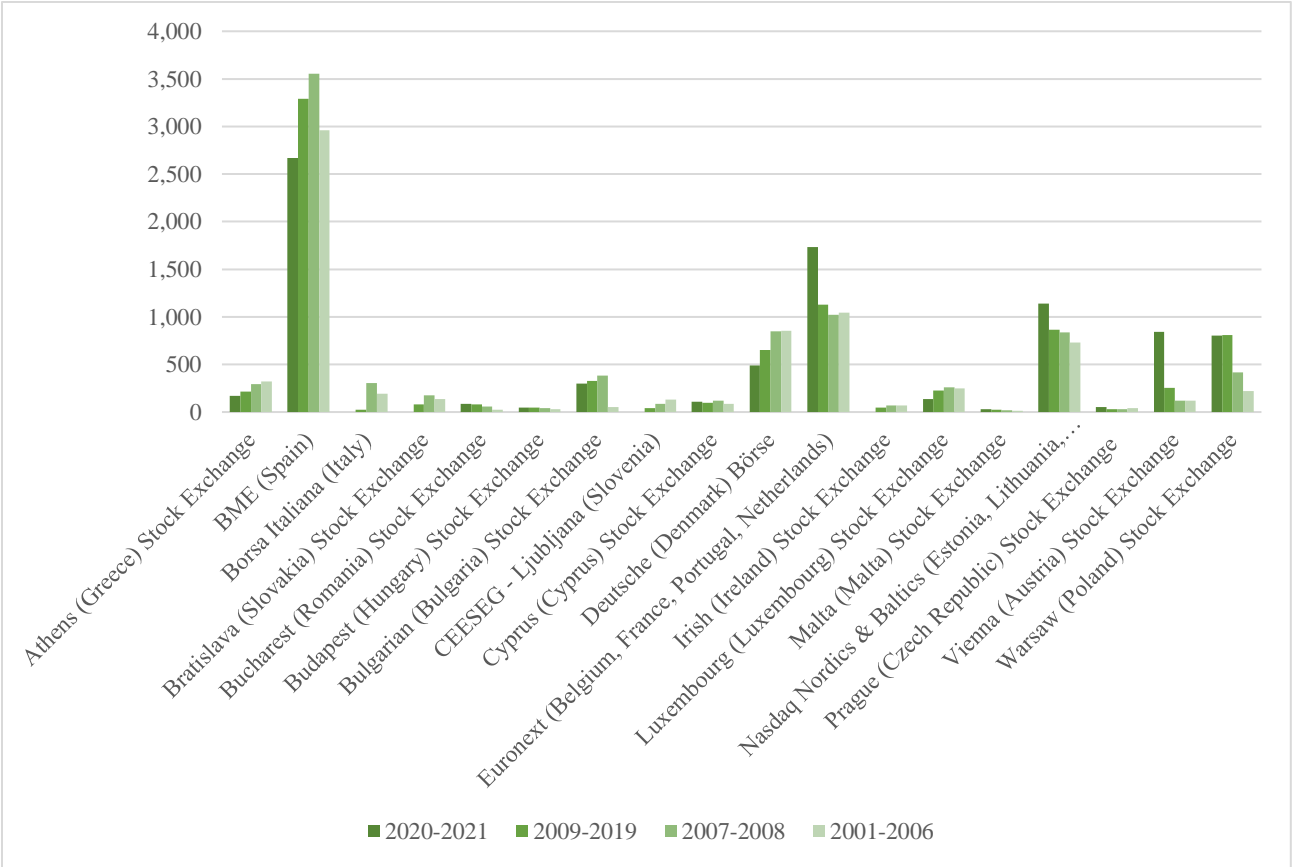


Figure 9. Average of stock companies of European Union stock exchanges in the periods 2001-2006, 2007-2008, 2009-2019 and 2020-2021.

(Compiled by the author based on FESE data)

Analyzing the periods of 2001-2006, 2007-2008, 2009-2019 and 2020-2021, author observed that BME (Spanish Exchange) grew really fast in the crisis and post-crisis period. If before the crisis this stock exchange had 2,958 then during the crisis this number grew rapidly to 3,557 (increased by 17 percent). After the crisis, these figures began to change, with the number of public companies falling by 8 percent in 2009-2019. Moreover, during 2020-2021 coronavirus pandemic the number of public companies fallen by a further 18 percent. However, Vienna Stock Exchange has seen a very rapid increase in the number of public limited companies. Comparing the period 2001-2006 and the period 2020-2021, the number of stock companies in Vienna Stock Exchange increased by 86% and reached 842 from 119 companies.

3.3 Turnover on bonds, derivatives, ETF's and stocks on European Union stock exchanges

Turnover refers to the activity of trading in securities over a period of time, which provides information on the amount of shares, contracts or other securities that have been bought or sold during a given period. In this section, the author presents the turnover of different types of securities on the European Union stock exchanges. Figure 10 shows the turnover of bonds, derivatives, ETF's and shares in the European Union during the period 2001-2021. Derivatives and ETF's are showed as covering their entire market without excluding one. Bond and ETF turnover data have been provided and is shown since 2002. The most dynamic turnover is in bonds and shares, bond turnover has been growing rapidly since 2002 and peaked in 2011, reaching 14,451,560 euros. However, since 2012, bond turnover has started to decrease and already in 2013 reached 8,40,627 euros, which is a decrease of 42 percent in two years.

The turnover of derivatives on the stock exchanges of the European Union compared to bonds turnover is small. At the beginning of the financial crisis (2007), the growth of derivatives increased by 87 percent, but already in 2008 this turnover fell again and remained relatively stable with corresponding fluctuations. Later on it had small increases and decreases with small fluctuations.

Interestingly, the ETF is considered as a new type of security, although it has existed in Europe since 2000. It is true that data on ETF turnover for 2001 are not available for the reason mentioned

above. There are very even fluctuations in ETF turnover. Since, this new type of securities is still new, the author pays more attention to the period 2009-2020. For example, after the financial crisis (2009-2020), the turnover of ETF's changes very similarly: 333,616 euros in 2009, 312,335 euros in 2010, 384,134 euros in 2011, and so on. It is true that the highest growth was observed in 2015, when the ETF turnover amounted to 386,020 euros.

The turnover of shares started at the beginning of the financial crisis - in 2007 it reached 10,358,553 million euros, but after the financial crisis it broke down and five years later it had already dropped by 67 percent in 2012 (at that time it amounted to 3,424,305 million euros).

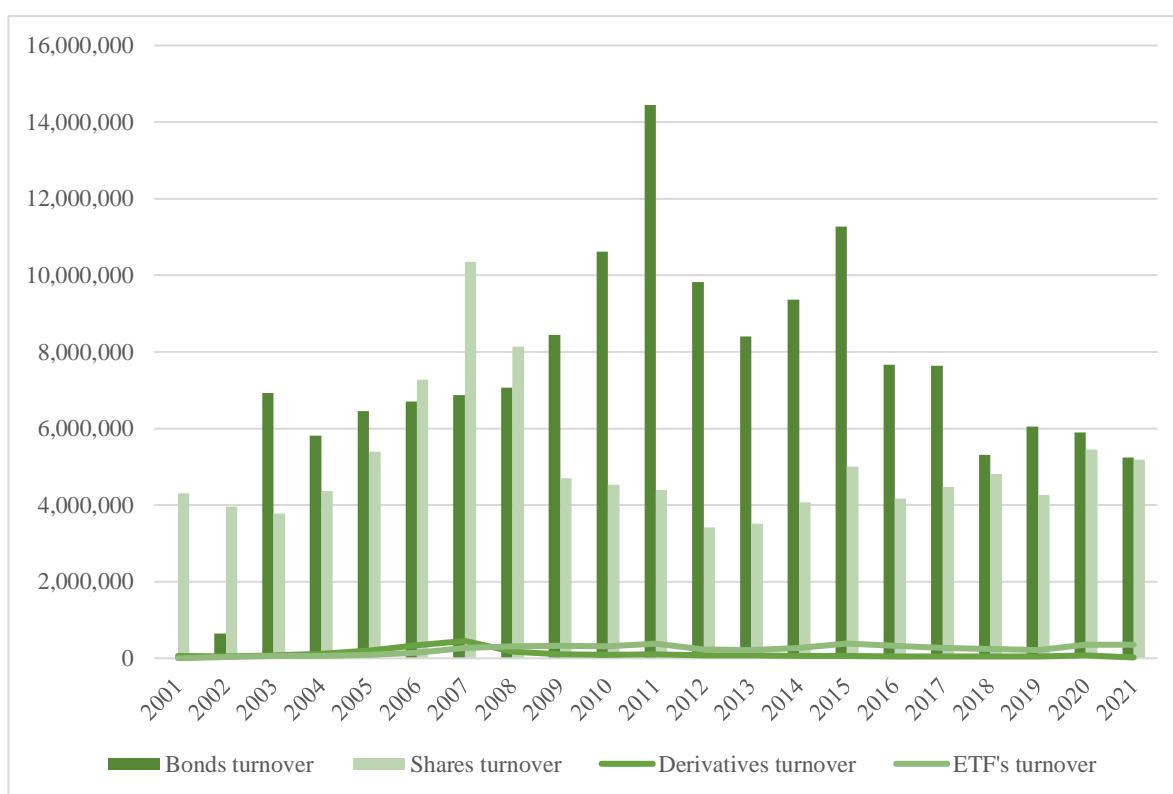


Figure 10. Turnover dynamics of bonds, derivatives, ETF's and stocks on the European Union stock exchanges during 2001-2006, 2007-2008, 2009-2019, 2020-2021 periods, mln. EUR.

(Compiled by the author based on FESE data)

At the choice of the author of the work the turnover of each type of security will be reviewed separately below. Looking at bond turnover (see figure 11), the author emphasizes that Borsa Italiana has not provided its data since 2010. However, the largest bond turnover is in Spanish BME (Spanish Exchanges) and Nordics & Baltics Nasdaq. BME (Spanish Exchanges) in pre-crisis period (2001-

2006) bond turnover amounted to 3,216,149 euros, and during the crisis grew up 28 percent. After the crisis period (2009-2019) it grew up by more than 30 percent and reached 6,908,481 euros. Another very important and significant bond turnover is Nasdaq Nordics & Baltics. This turnover was also affected by the crisis. It is noticeable that during the crisis (2007-2008) Nasdaq Nordics & Baltics bond turnover increased by 11 percent. However, after the crisis, already in 2009 it started to fall and fluctuated slightly in the following years, as a result of which the bond turnover of Nasdaq Nordics & Baltics decreased by 18 percent (reached EUR 1,648,224) in the period 2009-2019 compared to the bond turnover of the crisis year. Big impact financial crisis had to small Cyprus Stock Exchange. If before crisis Cyprus Stock Exchange obligation turnover was 6.2 million euros, then during financial crisis it grew up to 10.5 million euros and even in the latest years (2009-2019) it reached an important growth - 64.3 million euros. Unfortunately, not all exchanges have benefited from the crisis. The author of the paper notes that the Prague Stock Exchange has been hit hard by the financial crisis. Its bond turnover fell 69 percent between pre-crisis and post-crisis periods. If the turnover of Prague Stock Exchange bonds amounted to EUR 27,126.0 in 2001-2006, it started to fall immediately from 2007 and has not yet reached its highest turnover, which was 2005 with EUR 2,502,362.

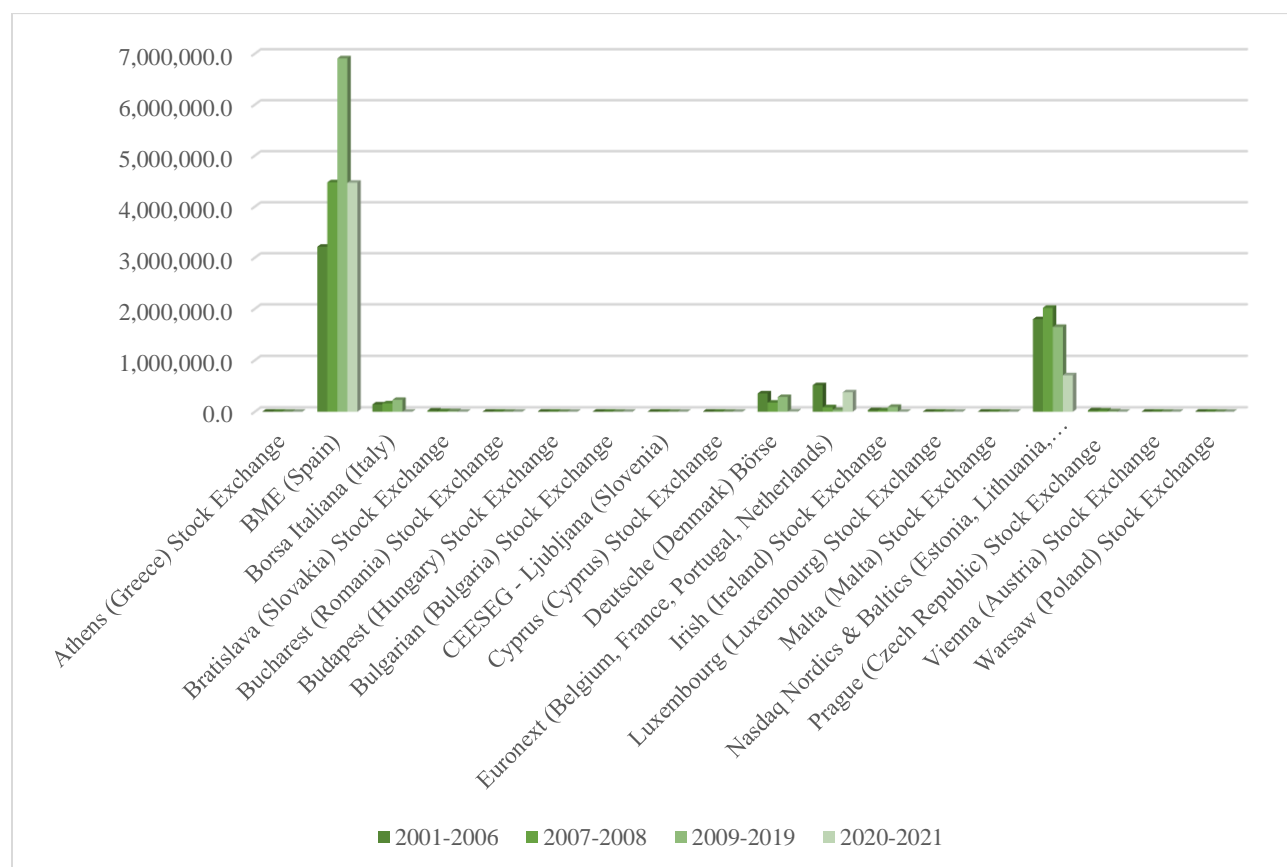


Figure 11. Average stock turnover of European Union bonds exchanges in periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE data)

Examining the turnover of derivatives on the European Union stock exchanges, different results emerge during the crisis and in the post-crisis period (see figure 12). At that time, most exchanges were not so successful in trading derivatives on this year. Deutsche Borse, Euronext and BME (Spanish Exchange) experienced a particularly sharp drop in turnover between 2007-2008 and 2009-2019. Deutsche Borse's turnover in derivatives was € 93 million, but although it grew by almost 57% during the crisis, it fell sharply after the crisis and reached half as much (€ 43 million) as it did before the crisis. It is true that with the onset of the coronavirus pandemic, Deutsche Borse's turnover in derivatives began to grow and reached EUR 45 million. The same happened with Euronext and BME (Spanish Exchange), although these two bond yields fell significantly after the financial crisis. During the coronavirus pandemic, the turnover of BME (Spanish Exchange) bonds increased slightly, while Euronext grew more significantly.

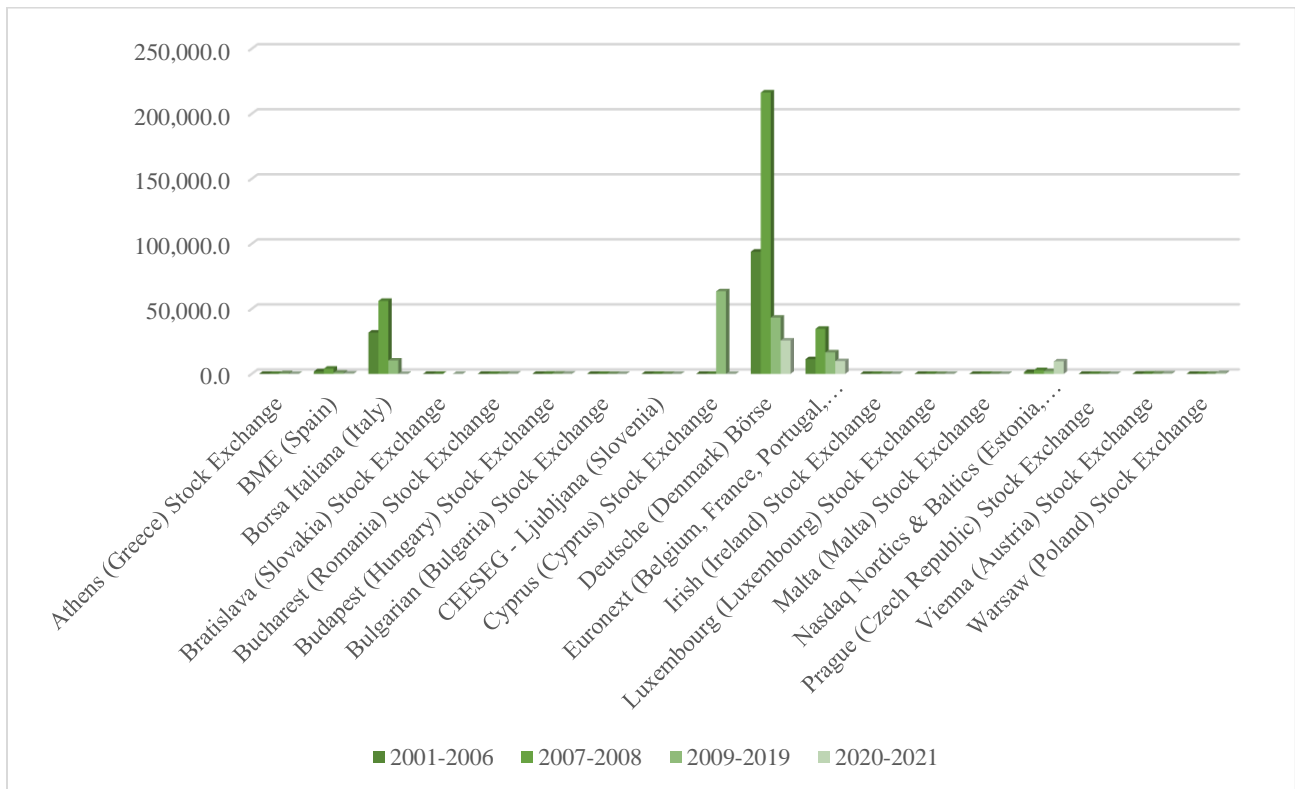


Figure 12. Average turnover of European Union stock exchange derivatives in the periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE data)

The turnover of ETF's is clearly reflected in the biggest growth of Deutsche Borse (see figure 13). During the financial crisis, after it and even during the coronavirus pandemic, this turnover of

Deutsche Borse ETF's grew and grew faster. It can be assumed that ETF's are still seen as news, so perhaps previous years are not as significant, but given the latter, this is a clear increase in 2019 and 2020. In 2019, Deutsche Borse ETF's turnover amounted to 139,778.5 million euros, and by 2020 it had already reached 237,338.2 million euros. This notes that the coronavirus pandemic did not cause problems for ETF's turnover growth. Glad for Deutsche Borse, but for others, the coronavirus pandemic didn't help that way. The ETF's turnover due to coronavirus fell sharply to BME (Spanish Exchanges) - from 2009 to 2019 it amounted to 5,243.8 million euros, and already in 2020 it fell to 2,548.3 million euros. The Vienna Stock Exchange also happened - in 2009-2019 their ETF's average turnover was 3,056.8 million euros, in 2010 it fell to 56.8 million euros and in 2020 it reached only to 172.2 million euros.

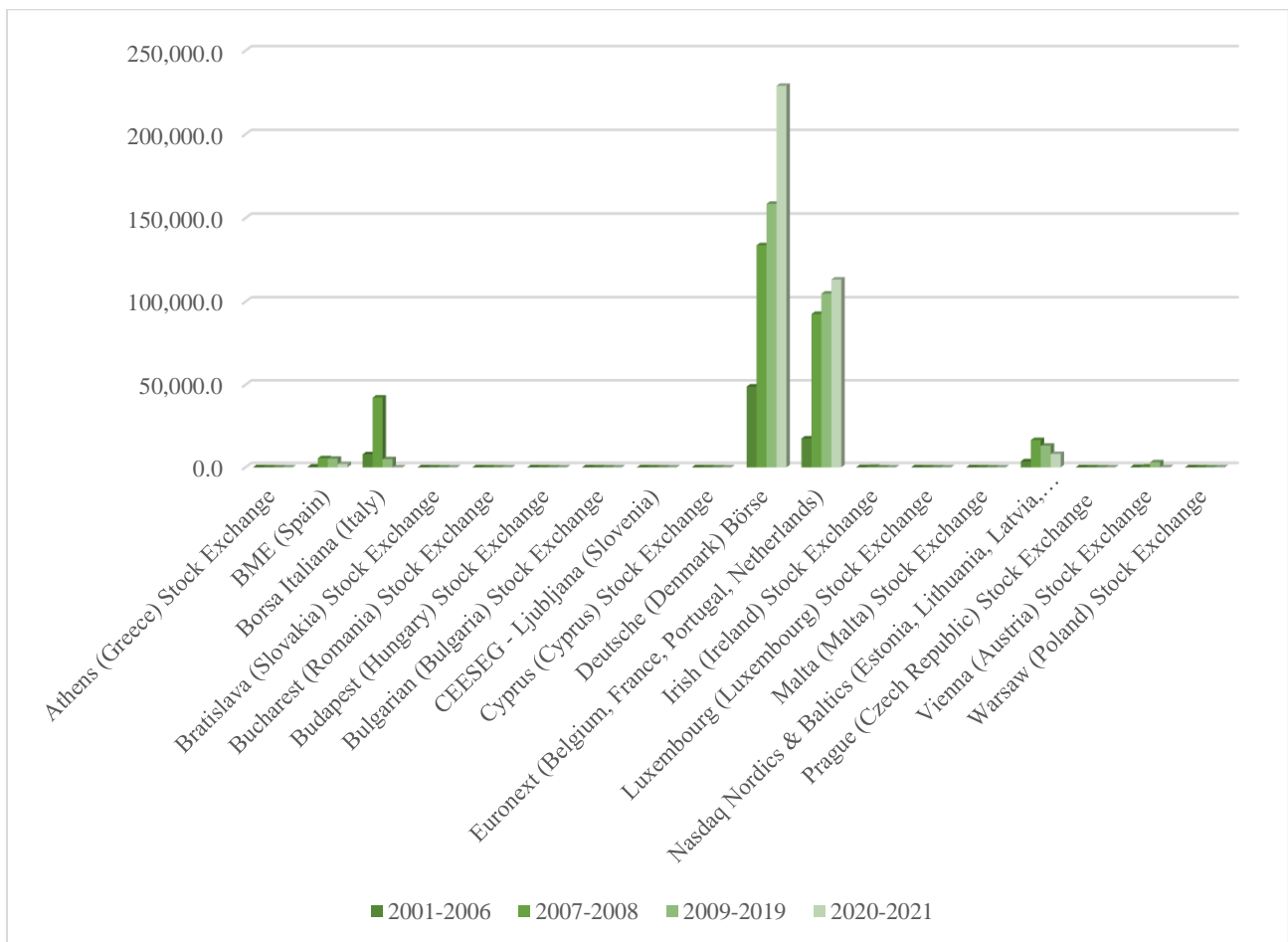


Figure 13. Average ETF turnover of European Union stock exchanges in the periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE data)

Analyzing stock turnover on European Union stock exchanges, turnover on average is 4,849,093 million euros between 2001 and 2006, between 2007 and 2008 it rose to an average of 9,251,372 million euros, again between 2009 and 2019 it decreased on average 4,308,031 million euros, and during the coronavirus pandemic - in 2020 started to rise again, reaching 5,445,507 million euros. Looking at figure 14, the author notes that the turnover of shares on the European Union stock exchanges are very high or low. During and after the crisis, only a few exchanges managed to increase their turnover than before the crisis: Prague Stock Exchange (increased by 86 percent), Bucharest Stock Exchange (increased by 84 percent), Vienna Stock Exchange (increased by 71 percent) and Warsaw Stock Exchange (increased by 70 percent). The sharp decrease in turnover was characterized by: Bratislava Stock Exchange (decreased by 54 percent). Assessing the coronavirus pandemic period with the financial crisis, Cyprus Stock Exchange (decreased by 99 percent), Luxembourg Stock Exchange (decreased by 94 percent), Bulgarian Stock Exchange (decreased by 93 percent), Prague Stock Exchange (decreased by 86 percent) and Athens Stock Exchange (decreased by 82 percent). Well, Malta Stock Exchange and Warsaw Stock Exchange performed best. Malta Stock Exchange during the financial crisis of 2007-2008 had the average share turnover of 56.8 million euros and in 2020 it increased slightly - 58.6 million euros (3 percent growth). Well, the changes on Warsaw Stock Exchange are more pronounced: during the 2007-2008 financial crisis, the average share turnover was 53.450 million euros and in 2020 it rose to 70.058 million euros (31 percent growth).

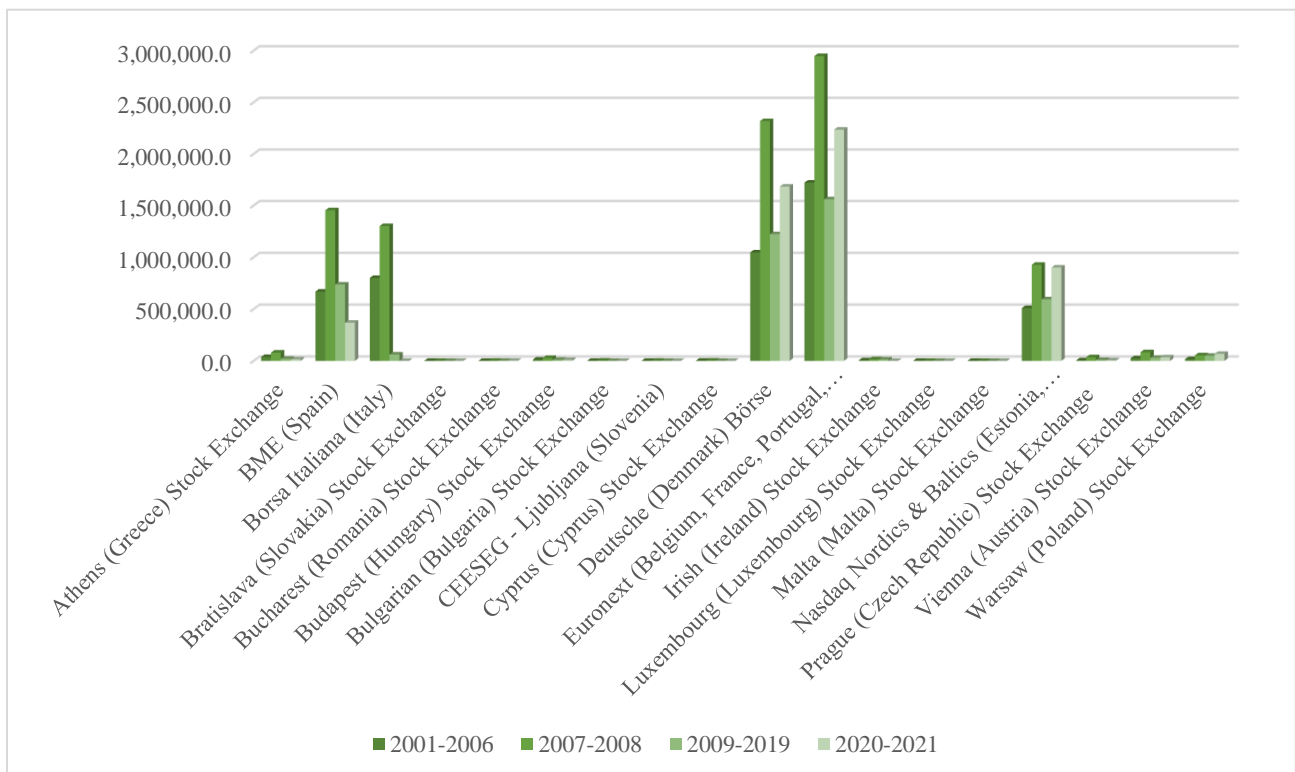


Figure 14. Average stock turnover ratio of European Union stock exchanges in the periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE data)

Summarizing European Union turnover of stock exchanges, which is one of the indicators assessing liquidity, the shares of public limited companies have the highest turnover, which attracts the most funds from investors, although it is the most risky investment vehicle (ETF figure). After the shares, higher security is characterized by bonds, which can be corporate, government and during the period under review differs in the dynamics of their turnover compared to shares, which has been growing since the beginning of the period under consideration. Analysis of derivatives and ETF turnover has shown that European Union investors are still reluctant to invest in these instruments because their turnover is relatively low but stands out for greater stability, even during the financial crisis.

3.4 Application of correlation and regression between stock turnover of the European Union capital markets and the number of COVID-19 cases

COVID-19 (coronavirus) pandemic started in 2020. Number of cases has been growing rapidly not only in Asia, America and other countries, but also in Europe. Coronavirus pandemic has halted many businesses, people lost jobs, even many friends and relatives passed away and fundamentally this pandemic completely changed our lives. Actions of the European Union capital market have been discussed earlier in this work. However, how has this pandemic affected the European Union's capital markets? Thus, in this part of the paper, the author will identify and perform correlation calculations on the relationship between the number of cases caused by the COVID-19 (coronavirus) pandemic and the turnover of stock markets in the European Union. MS Office Excel will be used for correlation calculations and after summary of results will be provided.

Because FESE's main advantage is that it has the largest database of European securities, as each member of the federation is required to report on its stock exchanges on a monthly basis. The author of the paper assumes that stock exchanges reflect the capital markets of the EU countries in which they operate.

Integration between bond markets is analyzed on the basis of the number of new cases of the coronavirus pandemic and the turnover of bonds on the stock exchanges of the European Union member states. According to the EU's assessment of the causes of the global financial crisis (de Larosière Report, 2009), there are three main problems contributing to the crisis, such as the failure to regulate capital markets. One of the reasons may be the effects of a coronavirus pandemic. Analyzing table 3, the author notes that smaller stock exchanges such as Cyprus Stock Exchange and Malta Stock Exchange have a very strong correlation between bond turnover and the number of new cases of COVID-19. This means that for these two stock exchanges, the coronavirus pandemic has a strong impact on bond turnover. By the author de Larosière, one of the problem is structured finance products are complex, so for the such a small stock exchange as it is Cyprus it might be the main trigger. Looking in detail, it can be seen that both Cyprus and Malta Stock Exchanges bond turnover grew sufficiently in 2020. Weak correlation is characterized by one of the largest stock exchanges - Euronext. The author notes, that from the analysis it is seen that for such stock exchange as Euronext there is no such a big impact and it can be assumed, that the bigger stock exchange is the less consequence it might get. Other stock exchanges share average correlation coefficients which means, that for these stock exchanges bond turnover it does not have no positive, no negative impact.

Table 3. Correlation coefficients of COVID-19 new cases numbers with the bond turnover of the European Union stock exchanges.

Stock exchanges	Athens (Greece) Stock Exchange	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Bulgarian (Bulgaria) Stock Exchange
Correlation	0.59	0.81	0.87	0.89	0.68
Stock exchanges	Cyprus (Cyprus) Stock Exchange	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)	Luxembourg (Luxembourg) Stock Exchange	Malta (Malta) Stock Exchange
Correlation	0.92	0.72	0.49	0.63	0.9

Table 4. (Continuation) Correlation coefficients of COVID-19 new cases numbers with the bond turnover of the European Union stock exchanges.

Stock exchanges	Warsaw (Poland) Stock Exchange	Prague (Czech Republic) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)
Correlation	0.73	0.8	0.7	0.87

(Compiled by the author based on the data of FESE and Worldometers)

To summarize, each stock exchange correlates very differently with the incidence of new cases of a coronavirus pandemic. However, the author notes that the average correlation during 2020 was 0.76, which means that bond turnover has a fairly strong correlation with the number of COVID-19 cases.

To calculate the correlation between the turnover of derivatives on the European Union stock exchanges and the number of new cases of a coronavirus pandemic, the data that best reflect the period under review were selected. As a result, the list of stock exchanges fell by five stock exchanges.

Table 5. Correlation coefficients of COVID-19 new cases with the turnover of derivatives on the European Union stock exchanges.

Stock exchanges	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)
Correlation	0.8	0.85	0.79	0.7	0.73
Stock exchanges	Warsaw (Poland) Stock Exchange	Prague (Czech Republic) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)	
Correlation	0.71	0.71	0.65	0.69	

(Compiled by the author based on the data of FESE and Worldometers)

It is seen from Table 5 that in 2020 there were no very strong correlations on the stock exchanges with the new cases of COVID-19. However, most of the usually strong correlations are here: Bucharest Stock Exchange, BME (Spanish Exchange), Budapest Stock Exchange, Euronext, Warsaw Stock Exchange, Prague Stock Exchange and Deutsche Börse. Author Matyas stated that after the financial crisis the way in which financial institutions positions were managed should not have been regulated. But the author of this work believes that especially this correlation of the new coronavirus cases and turnover of derivatives means that because there is no such a strong correlation coefficients partly European Union stock exchanges were regulated well. Mean correlation coefficient was observed on two stock exchanges: Nasdaq Nordics & Baltics (0.69) and Vienna Stock Exchange (0.65). Correlation coefficients of these two stock exchanges lack very little to a strong correlation.

To calculate the correlation between the turnover of ETF's on the European Union stock exchanges and the number of new cases of a coronavirus pandemic, the data that best reflect the period under review were selected as it was mentioned above. As a result, this list of stock exchanges fell by four stock exchanges.

Table 6. Correlation coefficients of the number of cases of COVID-19 cases with the ETF turnover of the European Union stock exchanges.

Stock exchanges	Athens (Greece) Stock Exchange	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Bulgarian (Bulgaria) Stock Exchange
Correlation	0.68	0.75	0.77	0.73	0.63
Stock exchanges	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)	Vienna (Austria) Stock Exchange	Warsaw (Poland) Stock Exchange
Correlation	0.71	0.73	0.67	0.5	0.7

(Compiled by the author based on the data of FESE and Worldometers)

In a view of the dependence of the ETF's turnover between the members of the European Union and the number of new cases of the coronavirus pandemic, 10 stock exchanges were selected,

on the basis of which the most realistic results were obtained (see table 6). It is observed that ETF's have similar results to the correlation results of derivatives. Thus, very strong correlation coefficients were not detected, but the overall average is 0.69, which means that the stock market correlation is mean. ETF's are still considered to be as a "new thing" and have not been hit very hard by the coronavirus. Even young companies during the financial crisis have created new jobs and even higher growth has been driven by fast-growing companies. Therefore, one of the EU's main tasks is to support and finance such companies (Menon C., Gal P.N., Criscuolo Ch., 2014). Table 5 shows that some stock exchanges will need such assistance. For example, Vienna Stock Exchange has a weak correlation coefficient (0.5) and six out of ten stock exchanges have a strong correlation coefficient, but the Bucharest Stock Exchange has the strongest correlation coefficient (0.77) which means that this stock exchange had the biggest impact.

Table 7. Correlation coefficients of the number of new cases of COVID-19 with the turnover of shares of the European Union stock exchanges.

Stock exchanges	Athens (Greece) Stock Exchange	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Bulgarian (Bulgaria) Stock Exchange
Correlation	0.72	0.78	0.84	0.78	0.77
Stock exchanges	Cyprus (Cyprus) Stock Exchange	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)	Luxembourg (Luxembourg) Stock Exchange	Malta (Malta) Stock Exchange
Correlation	0.92	0.71	0.74	0.8	0.84
Stock exchanges	Warsaw (Poland) Stock Exchange	Prague (Czech Republic) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)	
Correlation	0.79	0.76	0.68	0.74	

(Compiled by the author based on the data of FESE and Worldometers)

The highest correlation was in the Cyprus Stock Exchange (see table 7), where between stock turnover and the coronavirus pandemic is 0.92 coefficient, indicating a very strong correlation. Looking deeper into 2020, it can be seen how the turnover of Cyprus stocks has grown as the number of new diseases has increased. If in January 2020 the turnover of Cyprus shares amounted to only 0.1 million euros and there were no new cases of coronavirus. Then, later on, in December of the same year the turnover of Cyprus shares reached 12.4 million euros and the number of new illnesses increased to 11,454. Basically, 12 stock exchanges had strong coefficients, but the author singles out the Vienna Stock Exchange, whose correlation coefficient is mean (0.68).

In summary, it can be stated that when examining bond turnover, the weakest correlation, in this case, was one of the largest stock exchanges - Euronext (0.49), while one of the smallest stock exchanges - the Cyprus Stock Exchange - stood out with the highest correlation coefficient of 0.92. When analyzing derivatives and ETF turnover, Vienna Stock Exchange achieved an average correlation coefficient, while the Bucharest Stock Exchange showed a strong correlation. Stock turnover on average is 0.78, indicating that the stock turnover was affected by the coronavirus pandemic. Moreover, it can be stated that regardless of the size of the stock exchange, all stock exchanges changed in one or another way during the analyzed 2020 period. In general, investors or shareholders are often interested in a company's performance, its value, as these are important aspects in valuing a company (Kothari, 2001). However, the crisis has led to many companies going bankrupt, rising unemployment, declining corporate values and the economy. Because of that, the correlation results in table 6 also show how the low value and the bigger value having stock exchanges survives. The turnover of the analyzed stock exchanges increased and decreased in almost every member of the European Union, but the results of the study confirm the assumption that COVID-19 had a positive and negative impact on smaller stock exchanges. Furthermore, for more detailed research the author of the work provides a regression analysis below.

The coefficient of determination, or R square, is the most important part of the linear regression model. This is a measure of the differences in the values of the modeled dependent variable. The higher the value of this coefficient, the more suitable the model for the data. It is important to assess the relationship between each stock exchange and the COVID-19 cases to assume if this has an impact on the EU Capital Markets Union. For this reason, the results of the coefficients of

determination (R square) were evaluated with the help of regression analysis. As in the previous section, the FESE database was used to collect the data. It has the largest database in terms of European securities for analyzing data with even monthly accuracy.

Various trends are observed in the analysis of regression R square coefficients. Based on Table 7, it can be seen that the highest regression coefficient R square or otherwise is characterized by the Cyprus Stock Exchange. For this European Union stock exchange R square coefficient is 0.85, which means that even 85 percent shows the likelihood of exposure between coronavirus cases and bond turnover values. Also, five other stock exchanges have similar ratios. Budapest stock exchange - 0.79, Bucharest stock exchange - 0.77, Nasdaq Nordics and Baltics - 0.76, Malta stock exchange - 0.74 and BME - 0.67. This indicates that even the growth of coronavirus morbidity rates has a significant impact on bond turnover in stock exchanges of different sizes. Looking at the details, it can be seen that the numbers of bonds on all these stock exchanges have been growing rapidly.

According to the literature and generally accepted opinion, the financial sector has played a crucial role in stimulating economic (Levine, 1997). From the authors point of view – financial sector and especially stock exchanges play a big role in today's economy. And one of the obvious problems was and is funding. In general, the risk and the need for regulatory reform of financial markets is defined as the reform of the financial sector in the wake of the global financial crisis. Therefore, the actions taken during the global financial crisis have provoked various lessons (Acharya, Richardson et al., 2009; Admati, Hellwig, 2013). It states that even if the regression coefficient seems to be low for a small value stock exchange it doesn't mean, that this stock exchange is perfect, has a good funding. Moreover, the lowest regression coefficient R square has - Euronext. This stock exchange bond turnover is one of the largest and will not be hit hard, precisely because of its size in general. Taking into account the more detailed data, the author of the paper noticed that from January 2020 to December of the same year, the turnover of bonds of this stock exchange increased by as much as 93%. However, as this stock market is already volatile, it can only be partially argued that coronavirus cases have had some of these effects.

Table 8. Regression coefficients of COVID-19 new cases numbers with the bond turnover of the European Union stock exchanges.

Stock exchanges	Athens (Greece) Stock Exchange	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Bulgarian (Bulgaria) Stock Exchange
Regression R Square coefficient	0.37	0.67	0.77	0.79	0.49
Stock exchanges	Cyprus (Cyprus) Stock Exchange	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)	Luxembourg (Luxembourg) Stock Exchange	Malta (Malta) Stock Exchange
Regression R Square coefficient	0.85	0.52	0.24	0.40	0.74
Stock exchanges	Warsaw (Poland) Stock Exchange	Prague (Czech Republic) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)	
Regression R Square coefficient	0.48	0.48	0.46	0.76	

(Compiled by the author based on the data of FESE and Worldometers)

In summary, from Table 7 it is seen that the turnover of bonds on stock exchanges size does not depend on the size of the regression coefficient. Even the largest stock exchanges can be severely affected or even marginalized. According to the detailed data, the turnover of all stock exchange bonds studied in the work has increased, but those affected by coronavirus diseases have already been explained above.

While analyzing the regression coefficient between cases of coronavirus cases and derivatives from Table 8, several stock exchanges had to be discarded due to inadequate data. Removed were - Athens stock exchange, Bulgarian stock exchange, Cyprus stock exchange, Luxembourg stock exchange, Malta stock exchange. In the case of other non-delisted stock exchanges, the highest regression coefficient was found for Bucharest stock exchange derivatives. Here, the ratio was 0.77, which means a 77 percent impact of coronavirus on derivatives.

No very low coefficient was found, although the Vienna Stock exchange reached 0.40 regression coefficient is the lowest. For other stock exchanges, the regression R square coefficient ranged between 0.66 and 0.44, which does not show a very significant impact on derivatives.

Table 9. Regression coefficients of COVID-19 new cases with the turnover of derivatives on the European Union stock exchanges.

Stock exchanges	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)
Regression R Square coefficient	0.66	0.71	0.52	0.49	0.53
Stock exchanges	Warsaw (Poland) Stock Exchange	Prague (Czech Republic) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)	
Regression R Square coefficient	0.44	0.46	0.40	0.48	

(Compiled by the author based on the data of FESE and Worldometers)

In the analysis of derivatives, five stock exchanges were excluded (see table 8). Same situation occurred in the case when analyzing ETF turnover (see table 9). In this part, four stock exchanges also had to be removed due to incorrect data. The following were excluded from the study: Cyprus

Stock Exchange, Luxembourg Stock Exchange, Malta Stock Exchange and Prague Stock Exchange. As in the correlation analysis, analyzing regression coefficients the results are quiet similar - it did not have a significant effect on coronavirus cases. It is likely that BME - 0.58, Bucharest stock exchange - 0.55, Euronext - 0.54 and Deutsche Borse - 0.51 may have some influence on ETF turnover. But Nasdaq Nordics & Baltics - 0.45, Budapest Stock Exchange - 0.43, Athens Stock Exchange - Warsaw Stock Exchange - 0.40, Vienna Stock Exchange - 0.26 and Bulgarian Stock Exchange - 0.20 got the lowest coefficients which means weak influence for ETF turnover of the European Union stock exchanges.

Table 10. Regression coefficients of the number of cases of COVID-19 cases with the ETF turnover of the European Union stock exchanges.

Stock exchanges	Athens (Greece) Stock Exchange	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Bulgarian (Bulgaria) Stock Exchange
Regression R Square coefficient	0.40	0.58	0.55	0.43	0.20
Stock exchanges	Deutsche (Denmark) Börse	Euronext (Belgium, France, Portugal, Netherlands)	Warsaw (Poland) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)
Regression R Square coefficient	0.51	0.54	0.40	0.26	0.45

(Compiled by the author based on the data of FESE and Worldometers)

In summary, from Table 9 it is seen that the overall average ETF turnover regression R square coefficient of all stock exchanges is 0.43, indicating that coronavirus cases are unlikely to be affected by ETF turnover.

As already mentioned, in the regression analysis, the coefficient of determination is the most important characteristic of the model for the data confidence, which explains what percentage of the behavior of the phenomenon is explained by the behavior of the variables. When the global economy seemed to be recovering from the previous financial crisis and other emerging challenges, countries were hit by the COVID-19 (coronavirus) pandemic. Its emergence and enforcement actions are like a big stone thrown into the relatively calm waters of the European economy (Fernandes N. 2020). However, when it is known how pandemic affected Spain during 2020 from regression analysis of the turnover of shares of the European Union stock exchanges author assumes that 63% coronavirus pandemic affected BME Spanish Stock Exchange. But it is not only country who has been affected more that 50%. Thus, when summarizing the results of stock turnover (see table 10), the Cyprus Stock Exchange has the greatest impact and connection - 0.72. Bucharest Stock Exchange - 0.69 and BME

- 0.63 share similar results. The least influence has Vienna Stock Exchange - 0.44, Prague Stock Exchange - 0.48 and Athens Stock Exchange with Budapest Stock Exchange - 0.49. Which means, that these stock exchanges were affected by coronavirus less than 50%.

Table 11. Regression coefficients of the number of new cases of COVID-19 with the turnover of shares of the European Union stock exchanges.

Stock exchanges	Athens (Greece) Stock Exchange	BME (Spain)	Bucharest (Romania) Stock Exchange	Budapest (Hungary) Stock Exchange	Bulgarian (Bulgaria) Stock Exchange
Regression R Square coefficient	0.49	0.63	0.69	0.49	0.54
Stock exchanges	Cyprus Stock Exchange	Deutsche Börse	Euronext	Luxembourg Stock Exchange	Malta Stock Exchange
Regression R Square coefficient	0.72	0.51	0.55	0.61	0.57
Stock exchanges	Warsaw (Poland) Stock Exchange	Prague (Czech Republic) Stock Exchange	Vienna (Austria) Stock Exchange	Nasdaq Nordics & Baltics (Estonia, Lithuania, Latvia, Sweden, Finland, Iceland, Denmark)	
Regression R Square coefficient	0.57	0.48	0.44	0.55	

(Compiled by the author based on the data of FESE and Worldometers)

In summary, the negative effects of coronavirus will require market resilience and strengthening by Cyprus Stock Exchange, Bucharest Stock Exchange and BME, which is likely to reduce the scope for further development of the EU Capital Markets Union project, leading to a longer extension or termination.

CONCLUSIONS

1. Analyzing various literature and revealing that the European Union's capital markets union faces challenges such as financial stability, access to finance for growth, innovation it is needed to stimulate the growth of large capital markets. Based on various scientific and journalistic literature sources it is revealed that capital markets help economy to grow and help to be efficient in ongoing transactions. However, after analysis for the conclusions capital markets also facilitate securities trading for companies and investors and help ensure the movement of capital. Moreover, capital markets have made a big impact to European Union, because European Union's Capital Markets Union was created and have a big and mean impact to them. It is revealed that one of the main goals of the European Union Capital Markets Union is to make it easier for all businesses. They pay a lot of attention especially to small and medium-sized business that they will be able to access the financing. It is said that small and medium-sized businesses are a key drivers of economic growth. The European Union is based on bank loans for businesses and at the same time for current situation it needs to facilitate easier lending or lending with exceptions to small businesses, because small and medium sized business are the one of the parts for economic growth. The European Commission is therefore working to improve access to capital through the creation of a European Capital Markets Union and shared four main measures for the implementation of the project.
2. After analysis of today's European Union, its top priority is to ensure that Europe recovers from the unprecedented economic crisis caused by COVID-19. Capital Markets Recovery Package have been identified as one of the top priorities in the Council and in the negotiations with the EU legislators. Large and integrated capital markets will facilitate the recovery of the EU economy and ensure that businesses, especially small and medium-sized enterprises, have access to sources of finance and capital and that savers in Europe do not lack the confidence to invest in their future. In order to promote the use of a simple, transparent and standardized label, preferential risk weights are set for the higher priority segments held by the originator, and the European Banking Authority will closely monitor the market for such products to ensure that banks are not exposed to excessive leverage. The new rules also remove regulatory barriers to the securitization of non-performing positions. Moreover, today Europe is facing new and diverse challenges, but European Union Capital Markets Union is not an exception. Main challenges facing the European Union Capital Markets Union are: financial stability and economic

resilience, climate emergency, access to capital to fund innovation and growth, protectionist trade policies, increase in inequality.

3. A methodology for determining the impact of the coronavirus pandemic on the European Union Capital Markets Union has been developed. This methodology is divided into three parts: data collection, data processing and presentation of analysis and conclusions. The first part includes the main indicators evaluating the activities of stock exchanges: the capitalization of stock exchanges, the turnover of bonds, shares and other securities issued, the amount of public listed companies on stock exchanges. In the second part, the data are processed using descriptive statistics using the graphical representation method. The third part uses correlation and regression analysis to make the conclusions, because it is necessary to analyze whether the new cases of the coronavirus pandemic affect the European Union capital market and how the two phenomena are related and determine each other.

4. The assessment of the European Union capital markets the assumption was made that the capital markets of the European Union members are best characterized by the stock exchanges operating in those Member States for this work. After analysis of the capitalization of the European Union capital markets shows that the securities market is gradually recovering. However, an analysis of the capitalization data of individual European Union stock exchanges shows that the situation is volatile. An examination of the number of public limited companies on the European Union stock exchanges, which allows the investor to allocate risk more efficiently, showed that this indicator grew almost steadily until 2008, but fell after the financial crisis in 2009. It is gratifying that since 2018 the number of stock companies, can be said, have stabilized and this is beginning to reflect the attraction and growth of new stock companies. After analyzing the number of stock companies, it was found that the most listed stock companies have BME (Spanish Exchange) during the whole period under review. An analysis of the turnover of derivatives and ETF's makes author think that European Union investors are still reluctant to invest in these instruments. It might be due to their relatively low turnover, but they also have an advantage because are more stable. Summarizing, the turnover of stock exchanges on the European Union stock exchanges, which is one of the indicators assessing liquidity, the shares of public limited companies have the highest turnover, which attracts the most funds from investors, although it is the most risky investment vehicle.

5. A correlation analysis was carried out to assess the impact of pandemic caused new disease cases by also using European Union stock exchanges data. After the correlation analysis, in terms of bond turnover, the Cyprus Stock Exchange stood out with the highest and strongest correlation coefficient and was as high as 0.92. Weak correlation, in this case, had one of the largest stock exchanges - Euronext (0.49). Analyzing derivatives and ETF turnover - correlation coefficients were partly between of these two. Here, the Bucharest Stock Exchanges stood out as it had a strong correlation, while the Vienna Stock Exchange reached mean correlation coefficient. An interesting situation was when analyzing stock turnover. Stock turnover on average reached 0.78, indicating that the coronavirus pandemic did have an impact on stock turnover. Thus, in summary, regardless of the size of the stock exchange, they all changed in one or another way during the analyzed 2020 period. Analyzed turnovers for exchanges increased and decreased for almost every European Union member, however, COVID-19 had positive and negative impact on smaller stock exchanges. As a result, it can be said that the European Union's capital markets union will continue their plans. Regression analysis has shown that some capital markets have to start to worry up and think about strengthening. An analysis of bond turnover and turnover of shares found that the Cyprus Stock Exchange has the highest regression R square coefficients, indicating that this stock exchange is strongly affected by coronavirus - induced cases. Also, the analysis of the data concludes that the size of the capital market does not have a strong impact on turnover and coronavirus cases. However, regardless of whether the capital market is large or small, it is necessary to strengthen this market so that the EU Capital Markets Union project have to continue without the collapse of some markets.

SUGGESTIONS

1. After analyzing the perceptions of various authors about EU capital markets and conducting a quantitative empirical correlation - regression research, it is proposed to continue and deepen the analysis of the impact of capital markets on the financial market after the implementation of the EU Capital Markets Union initiative. However, the EU Capital Markets Union is invited to pay more attention to the impact of coronavirus on capital markets, to analyze the current and past situation in capital markets and to offer additional sources of assistance. Integrating the project across the EU would allow a more accurate assessment of the impact on both the European financial market and financial stability. However, as businesses often remain private for longer or become public, this process needs to be managed. Hence the proposal to strengthen regulatory control and the willingness to finance private companies. This could be done if the Capital Markets Union provided a simplified process for raising capital for public companies. Also, with regard to the regulation of capital markets, the author would suggest that the capital markets themselves take the initiative and make proposals to regulators on various issues, most notably on the consequences of the current coronavirus pandemic. One more proposal could be for capital markets to try to ask the European Union's Capital Markets Union for professional advice on one or other of the issues that matter to them. This could help capital markets grow and strengthen.
2. After collecting data for the research it is seen that today's capital market data is not yet fully available to everyone. Only new technologies or new products could help to reduce barriers to entry or even lower the cost of trading. In general, capital market participants are increasingly demanding smoother sources of information, clearer access and faster processes. The main problem is cyber security. Therefore, with the rapid development of the capital market and the development of the Capital Markets Union project, the author's proposal would be to pay more attention to data protection. This could be done by attracting additional cyber security initiatives, by seeking additional alternatives or systems for capital markets to take care of their own data.
3. By forming a methodological part of the study and conducting the research, it could be expanded in the future. However, as it was mentioned above - the research could cover not only the capital markets of the European Union, but also the capital markets of the United States. It would be possible to observe how the coronavirus pandemic affected not only Europe but also the United States, how the capital markets of these countries correlate with each other and how they affect

each other. The study could also be extended to assess the effects of Brexit on the impact of Britain's withdrawal from the European Union on the European Union's capital market.

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COVID-19 IMPACT ON THE EUROPEAN UNION CAPITAL MARKETS UNION

Eglė DAUKANTAITĖ

Master thesis

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SANTRAUKA

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Pagrindinis šio baigiamojo magistro darbo tikslas yra išanalizuoti galimą koronaviruso įtaką Europos Sąjungos kapitalo rinkoms.

Magistro baigiamasis darbas susideda iš keturių pagrindinių dalių: literatūros analizė, metodologija, tyrimas ir jo rezultatai, išvados ir pasiūlymai.

Literatūros analizės apžvalgoje pastebima, kad kapitalo rinkų sąjunga siekia skatinti stipresnį ekonomikos augimą Europos Sąjungoje. Siekiant šio tikslo, dedamos pastangos sukurti labiau integruotas kapitalo rinkas, didinant kapitalo pritraukimo išlaidas, pašalinant kliūtis tarpvalstybinėms investicijoms ir gerinant verslo galimybes gauti finansavimą. Sėkmingas kapitalo rinkų sąjungos veikimas priklauso nuo valstybių narių. Europos Komisijai pateikus visus Europos Sąjungos kapitalo rinkos sąjungos veiksmų plane numatytus pasiūlymus, nacionalinėms institucijoms tenka svarbus vaidmuo tiek įgyvendinant Europos Komisijos priemones, tiek vykdant kitas su kapitalo rinkų plėtra susijusias iniciatyvas. Tačiau, kai atrodė, kad pasaulio ekonomika atsigavo po praėjusios finansų krizės ir kitų kylančių iššūkių, mus pasitiko COVID-19 (koronaviruso) pandemija. Dėl to Europos Komisija paskelbė apie naują ir ambicingą veiksmų planą, skirtą Europos Sąjungos kapitalo rinkos sąjungai stiprinti ateinančiais metais. Šiandien svarbiausias ES prioritetas yra užtikrinti, kad Europa atsigaūtų po precedento neturinčios ekonominės krizės, kurią sukėlė COVID-19. Tam reikia plėtoti ES kapitalo rinkas ir turėti prieigą prie rinkos finansavimo, taip pat nedelsiant remti ekonomikos atsigavimą, palengvinant ES įmonėms. Pagrindiniai iššūkiai, su kuriais susiduria Europos Sąjungos kapitalo rinkų sąjunga, yra šie: finansinis stabilumas ir ekonominis atsparumas, klimato krizė, galimybė gauti kapitalo inovacijoms ir augimui finansuoti, protekcionistinė prekybos politika, nelygybės didėjimas. Dėl koronaviruso sukeltos pandemijos pradėtas šio darbo tyrimas, kuris atskleidžia, jog koronavirusas turėjo įtakos Europos Sąjungos kapitalo rinkų sąjungai. Pandemijos

sukeltų naujų susirgimų poveikiui įvertinti buvo atlikta koreliacinė analizė, naudojant Europos Sąjungos biržų duomenis. Apibendrinant galima teigti, kad nepaisant biržos dydžio, visos kapitalų rinkos, vienaip ar kitaip, pasikeitė per analizuojamą 2020 metų laikotarpį. Analizuojamos biržų apyvartos didėjo ir mažėjo beveik kiekvienoje Europos Sąjungos narėje, tačiau COVID-19 turėjo teigiamos ir neigiamos įtakos mažesnėms biržoms. Tačiau nepaisant to, ar kapitalo rinka didelė, ar maža, šią sritį būtina stiprinti, kad Europos Sąjungos kapitalo rinkų sąjungos projektas galėtų tęstis visu tempu, kol kai kurios rinkos nebuvo eliminuotos.

APENDICES

Appendice 1. Dynamics of the capitalization ratio of the stock exchanges of the European Union member states in the period of 2001-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Year	2021	2020	2019	2018	2017	2016
Market capitalization ratio	10,114,501	9,105,933	8,655,122	7,083,900	8,172,482	7,277,978
Year	2015	2014	2013	2012	2011	
Market capitalization ratio	10,553,136	9,817,890	9,379,395	7,837,928	7,181,792	
Year	2010	2009	2008	2007	2006	
Market capitalization ratio	8,110,049	7,345,168	5,461,740	10,640,955	9,515,748	
Year	2005	2004	2003	2002	2001	
Market capitalization ratio	8,617,994	6,332,498	6,165,876	5,227,644	7,262,236	

Apendice 2. Average stock market capitalization ratio of European Union stock exchanges in 2001-2006 and 2009-2019, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2009-2019
Athens Stock Exchange	47,859	33,525	42,240	35,309	37,546	45,579	59,939	34,039	26,020	50,379	78,505	44,631
BME	711,179	632,289	741,913	669,395	720,438	820,544	810,288	754,775	794,170	873,329	999,875	775,290
Borsa Italiana	0	0	0	0	0	0	0	0	0	0	457,126	41,557
Bratislava Stock Exchange	0	0	0	0	0	4,444	4,075	4,094	4,183	3,380	3,614	2,163
Bucharest Stock Exchange	23,332	18,160	19,688	16,811	16,967	18,385	17,834	12,088	10,818	9,776	8,402	15,660
Budapest Stock Exchange	29,366	25,231	26,340	21,270	16,191	12,012	14,355	15,742	14,630	20,624	20,888	19,696
Bulgarian Stock Exchange	14,267	13,685	0	4,951	4,391	4,988	5,093	5,025	6,358	5,498	6,031	6,390
CEESEG - Ljubljana	0	0	0	0	5,523	6,214	5,173	4,911	4,873	7,028	8,462	3,835
Cyprus Stock Exchange	3,822	2,895	2,356	2,386	2,464	3,331	1,527	1,514	2,198	5,094	7,157	3,159
Deutsche Börse	1,871,571	1,533,494	1,888,277	1,630,413	1,570,301	1,436,729	1,405,032	1,127,370	912,420	1,065,713	900,772	1,394,736
Euronext	4,193,921	3,259,249	3,666,833	3,287,230	3,025,561	2,742,873	2,600,836	2,148,215	1,884,745	2,184,076	1,999,967	2,817,591
Irish Stock Exchange	0	96,242	122,329	113,849	117,154	118,560	123,458	82,668	83,495	44,999	42,720	85,952
London Stock Exchange	0	0	0	0	3,591,430	3,316,431	3,094,337	2,592,751	2,532,107	2,716,589	1,950,048	1,799,427
Luxembourg Stock Exchange	39,456	43,233	57,293	57,871	43,135	52,202	57,070	53,352	52,093	75,381	73,219	54,937
Malta Stock Exchange	4,743	4,415	4,318	4,212	4,032	3,010	3,245	2,754	2,641	3,222	2,844	3,585
Nasdaq Nordics & Baltics	1,438,419	1,155,746	1,280,010	1,185,897	1,160,512	988,974	921,069	755,253	648,670	776,821	569,604	989,180
Prague Stock Exchange	23,427	23,574	26,910	22,195	23,543	22,644	21,991	28,193	29,203	31,922	31,265	25,897
Vienna Stock Exchange	118,724	102,050	125,744	95,201	87,932	79,988	85,394	80,429	65,683	93,944	79,511	92,236
Warsaw Stock Exchange	135,036	140,113	168,231	130,988	126,017	140,984	148,678	134,755	107,483	142,272	105,157	134,519

Appendice 2. (Continuation) Average stock market capitalization ratio of European Union stock exchanges in 2001-2006 and 2009-2019, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2006	2005	2004	2003	2002	2001	2001-2006
Athens Stock Exchange	152,208	123,033	9,214	84,547	6,576	96,949	78,755
BME	1,003,299	813,812	692,053	575,766	443,097	52,584	596,769
Borsa Italiana	778,501	676,606	580,881	487,446	457,992	592,319	595,624
Bratislava Stock Exchange	4,214	3,729	3,239	2,204	-	-	3,347
Bucharest Stock Exchange	18,858	13,535	-	-	-	-	16,197
Budapest Stock Exchange	31,687	27,586	21,039	13,228	12,493	11,565	19,600
Bulgarian Stock Exchange	783	4,312	2,062	-	-	-	2,386
CEESEG – Ljubljana	11,513	6,697	7,115	566	5,355	3,839	5,848
Cyprus Stock Exchange	12,254	558	3,588	3,807	4,505	6,572	5,214
Deutsche Börse	1,241,963	1,019,171	849,717	802,224	627,283	1,203,681	957,340
Euronext	2,812,261	2,294,828	1,796,036	1,646,178	1,477,108	2,122,048	2,024,743
Irish Stock Exchange	123,824	96,722	83,933	67,444	5,754	84,567	77,041
London Stock Exchange	2,876,986	2,592,623	2,071,775	1,923,168	1,708,260	2,413,272	2,264,347
Luxembourg Stock Exchange	60,303	43,448	36,891	29,598	23,569	26,711	36,753
Malta Stock Exchange	3,416	3,474	2,089	1,467	1,319	1,528	2,216
Nasdaq Nordics & Baltics	85,146	680,412	54,229	468,199	385,247	580,449	375,614
Prague Stock Exchange	34,693	31,059	2,172	12,288	9,796	8,999	16,501
Vienna Stock Exchange	151,013	107,036	64,577	44,811	32,235	28,307	71,330
Warsaw Stock Exchange	112,826	79,353	51,888	2,935	27,055	28,846	50,484

Apendice 3. Average stock market capitalization ratio of European Union stock exchanges in 2007-2008 and 2020-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2021	2020	2008	2007	2007-2008	2020-2021
Athens Stock Exchange	46,452	41,758	64,737	181,233	122,985	44,105
BME	681,649	621,764	680,632	1,231,086	955,859	651,706
Borsa Italiana	0	0	374,702	733,614	554,158	0
Bratislava Stock Exchange	0	0	3,907	4,555	4,231	0
Bucharest Stock Exchange	24,402	20,847	6,474	21,524	13,999	22,625
Budapest Stock Exchange	23,698	22,787	13,326	31,528	22,427	23,242
Bulgarian Stock Exchange	14,900	14,497	6,371	14,821	10,596	14,699
CEESEG - Ljubljana	0	0	8,468	19,740	14,104	0
Cyprus Stock Exchange	4,084	3,844	5,733	20,160	12,947	3,964
Deutsche Börse	2,113,641	1,870,685	797,063	1,439,955	1,118,509	1,992,163
Euronext	4,918,211	4,458,593	1,508,423	2,888,313	2,198,368	4,688,402
Irish Stock Exchange	0	0	35,519	98,431	66,975	0
London Stock Exchange	0	0	1,352,327	2,634,577	1,993,452	0
Luxembourg Stock Exchange	50,737	42,234	47,809	113,597	80,703	46,485
Malta Stock Exchange	4,072	4,161	2,567	3,854	3,210	4,116
Nasdaq Nordics & Baltics	1,934,991	1,728,450	404,137	849,923	627,030	1,831,721
Prague Stock Exchange	24,294	21,767	29,615	47,987	38,801	23,031
Vienna Stock Exchange	121,679	108,176	54,752	161,731	108,242	114,927
Warsaw Stock Exchange	151,691	146,368	65,178	144,323	104,750	149,029

Appendice 4. Dynamics of the number of stock companies listed on the stock exchanges of the European Union member states in 2001-2021 period.

(Compiled by the author based on FESE provided data)

Year	2021	2020	2019	2018	2017	2016
Listed companies	8268	8298	8232	8265	7969	8122
Year	2015	2014	2013	2012	2011	
Listed companies	8324	8057	8199	8209	8306	
Year	2010	2009	2008	2007	2006	
Listed companies	8252	8644	8681	8607	7738	
Year	2005	2004	2003	2002	2001	
Listed companies	7684	7437	7824	7051	5974	

Appendice 5. Average of stock companies of European Union stock exchanges in the periods 2001-2006, 2007-2008, 2009-2019 and 2020-2021.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Athens Stock Exchange	167	176	181	187	200	218	240	0	251	265	272
BME	2,664	2,738	2,896	3,007	3,136	3,506	3,651	3,452	3,245	3,200	3,276
Borsa Italiana	0	0	0	0	0	0	0	0	0	0	0
Bratislava Stock Exchange	0	0	0	0	0	0	0	125	131	134	147
Bucharest Stock Exchange	82	83	83	87	87	86	84	83	83	79	79
Budapest Stock Exchange	45	45	44	43	41	42	45	48	50	52	54
Bulgarian Stock Exchange	257	259	262	274	0	354	365	372	381	387	393
CEESEG - Ljubljana	0	0	0	0	0	0	46	51	55	61	66
Cyprus Stock Exchange	106	107	110	102	74	81	84	94	95	101	106
Deutsche Börse	490	485	522	514	499	592	619	670	720	747	746
Euronext	1,526	1,493	1,220	1,208	1,255	1,051	1,068	1,055	1,062	1,073	1,112
Irish Stock Exchange	0	0	0	54	52	51	53	52	50	50	55
Luxembourg Stock Exchange	138	144	149	162	168	180	192	220	274	293	298
Malta Stock Exchange	27	27	27	25	24	23	23	24	24	22	21
Nasdaq Nordics & Baltics	1,098	1,071	1,082	1,019	984	938	832	787	755	751	773
Prague Stock Exchange	56	55	54	54	23	25	25	23	26	28	26
Vienna Stock Exchange	816	809	778	677	536	83	92	99	102	99	105
Warsaw Stock Exchange	796	806	824	852	890	892	905	902	895	867	777

Appendice 5. (Continuation) Average of stock companies of European Union stock exchanges in the periods 2001-2006, 2007-2008, 2009-2019 and 2020-2021.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
Athens Stock Exchange	280	288	292	292	290	304	321	340	338	332
BME	3,345	3,472	3,576	3,537	3,378	3,337	3,315	3,223	3,015	1,482
Borsa Italiana	0	296	300	307	290	0	294	279	0	294
Bratislava Stock Exchange	165	172	193	160	187	224	46	366	0	0
Bucharest Stock Exchange	69	64	64	54	53	59	0	51	0	0
Budapest Stock Exchange	52	46	43	41	41	44	0	0	48	56
Bulgarian Stock Exchange	390	399	399	369	0	331	0	0	0	0
CEESEG - Ljubljana	72	76	84	87	100	116	140	134	135	151
Cyprus Stock Exchange	110	115	119	124	141	119	124	130	0	0
Deutsche Börse	765	783	832	866	760	764	819	866	934	984
Euronext	1,135	1,160	1,002	1,043	954	966	999	1,047	1,114	1,194
Irish Stock Exchange	59	64	68	73	68	66	65	66	77	87
Luxembourg Stock Exchange	289	266	261	261	260	245	234	242	244	257
Malta Stock Exchange	21	20	19	16	15	14	14	14	13	12
Nasdaq Nordics & Baltics	778	797	824	851	791	704	675	714	757	749
Prague Stock Exchange	27	25	29	32	32	39	55	38	45	47
Vienna Stock Exchange	110	115	118	119	113	111	120	125	129	113
Warsaw Stock Exchange	585	486	458	375	265	241	216	189	202	216

Appendice 5. (Continuation) Average of stock companies of European Union stock exchanges in the periods 2001-2006, 2007-2008, 2009-2019 and 2020-2021.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2001-2006	2007-2008	2009-2019	2020-2021
Athens Stock Exchange	321	292	217	172
BME	2,958	3,557	3,290	2,701
Borsa Italiana	193	304	27	0
Bratislava Stock Exchange	137	177	79	0
Bucharest Stock Exchange	27	59	80	83
Budapest Stock Exchange	32	42	47	45
Bulgarian Stock Exchange	55	384	325	258
CEESEG - Ljubljana	129	86	39	0
Cyprus Stock Exchange	86	122	97	107
Deutsche Börse	855	849	652	488
Euronext	1,046	1,023	1,127	1,510
Irish Stock Exchange	72	71	49	0
Luxembourg Stock Exchange	247	261	226	141
Malta Stock Exchange	14	18	23	27
Nasdaq Nordics & Baltics	732	838	863	1,085
Prague Stock Exchange	43	31	31	56
Vienna Stock Exchange	119	119	254	813
Warsaw Stock Exchange	222	417	807	801

Apendice 6. Turnover dynamics of bonds, derivatives, ETF's and stocks on the European Union stock exchanges during 2001-2006, 2007-2008, 2009-2019, 2020-2021 periods, mln. EUR.

(Compiled by the author based on FESE provided data)

	2021	2020	2019	2018	2017	2016
Bonds turnover	1,958,082	5,893,315	6,043,013	5,309,700	7,635,568	7,660,435
Derivatives turnover	6,334	72,201	48,511	52,512	47,517	49,678
ETF's turnover	122,003	352,769	215,232	244,760	274,295	329,688
Shares turnover	1,831,257	5,445,507	4,264,887	4,809,161	4,474,231	4,172,351
	2015	2014	2013	2012	2011	
Bonds turnover	11,269,547	9,359,680	8,408,627	9,826,683	14,451,560	
Derivatives turnover	64,143	58,436	73,443	71,037	102,588	
ETF's turnover	386,020	265,857	214,533	225,904	384,134	
Shares turnover	5,011,274	4,075,902	3,511,918	3,424,305	4,386,433	
	2010	2009	2008	2007	2006	
Bonds turnover	10,613,671	8,447,336	7,065,884	6,873,540	6,709,514	
Derivatives turnover	90,669	100,381	174,270	454,034	335,965	
ETF's turnover	312,335	333,616	315,428	267,008	144,783	
Shares turnover	4,534,472	4,703,806	8,144,192	10,358,553	7,279,920	
	2005	2004	2003	2002	2001	
Bonds turnover	6,454,626	5,810,456	6,926,852	648,638	-	
Derivatives turnover	207,049	111,252	72,273	53,307	60,090	
ETF's turnover	88,562	58,582	63,990	36,249	-	
Shares turnover	5,388,832	4,369,116	3,780,897	3,960,005	4,315,790	

Appendice 7. Average stock turnover of European Union bonds exchanges in periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2001-2006	2007-2008	2009-2019	2020-2021
Athens Stock Exchange	47	21	110.8555556	226.85
BME	3216149.5	4478101.5	6908481.773	3121163.3
Borsa Italiana	141942.2	163442	230656	0
Bratislava Stock Exchange	22160.5	10362	10159.83333	0
Bucharest Stock Exchange	21	117.5	146.6909091	81.25
Budapest Stock Exchange	1194.8	1236.5	395.9272727	956.25
Bulgarian Stock Exchange	153	167	73.43	16.2
CEESEG - Ljubljana	699.6	346	84.42857143	0
Cyprus Stock Exchange	6.2	10.5	64.33636364	6.3
Deutsche Börse	355540	177293.5	286870.8636	5006.65
Euronext	515607.2	86598	35257.90909	264497.2
Irish Stock Exchange	29443.5	26075	94568.16	0
Luxembourg Stock Exchange	1089	253	148.1181818	40.85
Malta Stock Exchange	150.75	416	570.7090909	202.05
Nasdaq Nordics & Baltics	1798934	2020329.5	1648224.336	532937.9
Prague Stock Exchange	27126	21895	8522.745455	214.05
Vienna Stock Exchange	340.8	688.5	300.55	222.65
Warsaw Stock Exchange	935	578	697.9272727	253.8

Appendice 8. Average turnover of European Union stock exchange derivatives in the periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2001-2006	2007-2008	2009-2019	2020-2021
Athens Stock Exchange	0.04	0.04	466.74	0.00
BME	1917.70	3964.45	926.45	307.50
Borsa Italiana	31738.77	56067.10	10253.20	0.04
Bratislava Stock Exchange	0.04	0.04		0.04
Bucharest Stock Exchange	0.04	0.05	79.47	108.50
Budapest Stock Exchange	0.04	85.40	231.61	169.35
Bulgarian Stock Exchange	0.04	0.04	0.00	0.00
CEESEG - Ljubljana	0.04	0.04	0.04	0.04
Cyprus Stock Exchange	0.04	0.04	63508.90	0.04
Deutsche Börse	93908.03	216319.55	43253.11	23955.80
Euronext	11295.23	34624.40	16478.40	7654.00
Irish Stock Exchange	0.63	0.04	0.04	0.04
Luxembourg Stock Exchange	23.33	12.10	0.04	0.04
Malta Stock Exchange	0.04	0.04	0.04	0.04
Nasdaq Nordics & Baltics	1359.02	2866.55	2120.15	6533.55
Prague Stock Exchange	0.20	31.45	7.71	11.60
Vienna Stock Exchange	79.52	210.15	257.36	253.55
Warsaw Stock Exchange	0.03	13.50	140.44	427.50

Apendice 9. Average ETF turnover of European Union stock exchanges in the periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2001-2006	2007-2008	2009-2019	2020-2021
Athens Stock Exchange	0	30.6	20.7	5.9
BME	365.4	5514.45	5243.78182	1531.85
Borsa Italiana	7917.02	42210.8	4950.68182	0
Bratislava Stock Exchange	0	0	0	0
Bucharest Stock Exchange	0	0	0.41818182	1.8
Budapest Stock Exchange	25.14	20.35	3.23636364	1.45
Bulgarian Stock Exchange	0	0	0.3	0.75
CEESEG - Ljubljana	0.1	0.8	0.02727273	0
Cyprus Stock Exchange	0	0	0	0
Deutsche Börse	48838.52	133720.25	158430.718	161871.8
Euronext	17433.2	92640.65	104832.418	67497.5
Irish Stock Exchange	46.34	207.45	13.7545455	0
Luxembourg Stock Exchange	0	0	0.11	0
Malta Stock Exchange	0	0	0	0
Nasdaq Nordics & Baltics	3649.34	16501.5	13077.3818	6354.85
Prague Stock Exchange	0	0	0	0
Vienna Stock Exchange	158.06	371.35	3056.79091	92.2
Warsaw Stock Exchange	0	0	40.0454545	27.95

Appendice 10. Average stock turnover ratio of European Union stock exchanges in the periods of 2001-2006, 2007-2008, 2009-2019, 2020-2021, mln. EUR.

(Compiled by the author based on FESE provided data)

Exchange/EUR mln	2001-2006	2007-2008	2009-2019	2020-2021
Athens Stock Exchange	36969	79795	19609	9582
BME	668256	1454464	737118	261432
Borsa Italiana	800626	1301860	61195	0
Bratislava Stock Exchange	49	7	16	0
Bucharest Stock Exchange	210	1324	1428	1395
Budapest Stock Exchange	11786	27660	10338	6005
Bulgarian Stock Exchange	362	2461	252	118
CEESEG - Ljubljana	583	1461	275	0
Cyprus Stock Exchange	1342	2551	253	20
Deutsche Börse	1046954	2317443	1223196	1214332
Euronext	1721792	2947778	1559516	1450205
Irish Stock Exchange	5124	14848	13367	0
Luxembourg Stock Exchange	377	743	108	34
Malta Stock Exchange	88	57	60	37
Nasdaq Nordics & Baltics	509151	927442	593987	619997
Prague Stock Exchange	4934	34859	8859	3233
Vienna Stock Exchange	24444	83170	29235	23874
Warsaw Stock Exchange	16047	53450	49222	48119

Apendice 11. Monthly bonds turnover during 2020.

(Compiled by the author based on FESE provided data)

Stock Exchange	January	February	March	April	May	June	July
Athens Stock Exchange	24	47	71	81	93	107	134
BME	419,008	818,267	1,322,679	1,749,610	2,074,926	2,529,231	2,956,090
Bucharest Stock Exchange	0	0	0	0	1	1	1
Budapest Stock Exchange	18	45	45	45	197	302	597
Bulgarian Stock Exchange	2	3	5	5	6	6	13
Cyprus Stock Exchange	0	1	1	1	1	1	1
Deutsche Börse	688	1,408	2,538	3,161	3,618	4,140	4,821
Euronext	30,298	50,341	68,180	82,745	103,029	116,653	121,465
Luxembourg Stock Exchange	9	15	24	29	35	42	45
Malta Stock Exchange	30	55	85	108	125	139	157
Nasdaq Nordics & Baltics	21,062	45,988	64,057	78,716	91,614	102,789	109,340
Prague Stock Exchange	57	87	153	179	191	223	235
Vienna Stock Exchange	36	67	118	140	162	179	200
Warsaw Stock Exchange	52	93	160	209	262	318	383

Apendice 11. (Continuation) Monthly bonds turnover during 2020.

(Compiled by the author based on FESE provided data)

Stock Exchange	August	September	October	November	December
Athens Stock Exchange	141	148	161	173	351
BME	3,243,826	3,619,146	4,036,595	4,358,439	4,667,084
Bucharest Stock Exchange	10	13	20	40	63
Budapest Stock Exchange	686	723	1,056	1,496	1,577
Bulgarian Stock Exchange	17	20	20	21	23
Cyprus Stock Exchange	1	1	1	2	12
Deutsche Börse	5,208	5,740	6,356	6,936	7,586
Euronext	126,581	132,454	138,059	142,534	404,501
Luxembourg Stock Exchange	47	49	50	54	59
Malta Stock Exchange	179	199	230	249	269
Nasdaq Nordics & Baltics	116,992	120,258	125,391	137,348	811,130
Prague Stock Exchange	248	263	285	311	326
Vienna Stock Exchange	217	241	268	296	332
Warsaw Stock Exchange	429	470	524	576	629

Apendice 12. Monthly derivatives turnover during 2020.

(Compiled by the author based on FESE provided data)

Stock Exchange	January	February	March	April	May	June	July	August	September	October	November	December
BME	24.90	55.8	84.5	101.9	125.4	163	194	212.2	235.9	255.1	284.9	307.5
Bucharest Stock Exchange	6.20	16	28.6	39.6	53.8	78.2	92.4	102.3	122.3	144.3	162.7	171.1
Budapest Stock Exchange	20.40	47.2	93	128.4	154.4	189	213.7	230.4	255.1	280.9	310.6	336.4
Deutsche Börse	3017.40	6623	13007.3	17486.4	20821.9	24941.7	28871.8	32140.8	35560.5	39047.7	42672.7	45429.4
Euronext	1172.00	2489	4584	6078	7316	8725	9763	10673	11806	12748	13765	14721
Nasdaq Nordics & Baltics	382.10	2039.6	3405.5	4169.9	4867.8	5787.8	6657.9	7392.5	8267.1	9033.1	9718.7	10216.2
Prague Stock Exchange	0.60	1.2	3	7.1	9.7	11	11.9	13.4	14.3	15.3	17	18
Vienna Stock Exchange	31.80	67.3	134.7	174	200.9	226	247.3	264.4	283.6	306.6	338.8	376.9
Warsaw Stock Exchange	43.80	98.3	181.7	240.9	283.9	341.8	394.5	442.6	483.6	526.6	568.1	624.8

Appendice 13. Monthly ETF turnover during 2020.

(Compiled by the author based on FESE provided data)

Stock Exchange	January	February	March	April	May	June	July	August	September	October	November	December
Athens Stock Exchange	3.1	4.2	5.6	6.6	6.6	7.2	7.9	7.9	8.3	9	9.3	10
BME	124.5	361.2	819	1023.6	1274.1	1535.7	1712.5	1817.9	1974.8	2067	2354.2	2548.3
Bucharest Stock Exchange	0.2	0.5	0.9	1.2	1.4	1.5	1.6	1.7	1.9	2	2.2	2.4
Budapest Stock Exchange	0.1	0.2	0.6	0.9	1.2	1.4	1.5	1.6	1.7	1.8	2	2.2
Bulgarian Stock Exchange	0	0.1	0.6	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1	1
Deutsche Börse	16466.4	38633.8	75760.4	96139.2	113423.5	134037.4	150888.3	163495.1	179688	196990.7	218918	237338.2
Euronext	6499	15992	31918	40824	47811	57266	64340	68911	75595	82780	93562	102456
Luxembourg Stock Exchange	0	0	0	0	0	0	0	0	0	0	0	0
Nasdaq Nordics & Baltics	544.7	1273.4	3414.3	4367.8	5338.1	6379.3	7024	7539.2	8272.6	9017.2	9639.3	10239.1
Prague Stock Exchange	0	0	0	0	0	0	0	0	0	0	0	0
Vienna Stock Exchange	1.3	3	17.8	27.8	37.6	42.8	44.4	45.6	47.6	48.8	52.7	54.4
Warsaw Stock Exchange	5.9	16.7	49.5	71.6	88.4	105.2	114.3	120.3	131.1	140.3	156.2	172.2

Appendice 14. Monthly stocks turnover during 2020.

(Compiled by the author based on FESE provided data)

Stock Exchange	January	February	March	April	May	June	July	August	September	October	November	December
Athens Stock Exchange	1590.1	3299.9	5096.7	6108.5	7515	8924.7	10052.4	10683.7	11637.7	12534.8	14100	15984.4
BME	36171.9	73849.3	128658.8	160511.9	189333.2	238738.3	270196.2	289923	317652.9	345147.8	387200.4	423314.5
Bucharest Stock Exchange	203.3	384.4	710.8	889.6	1036.2	1158.8	1284.3	1439.3	1995	2135	2313.4	2527.1
Budapest Stock Exchange	749.6	1639.4	3033.9	4067.5	4807.5	5726.3	6260.5	6723	7326.5	7797.8	8788.2	9470.6
Bulgarian Stock Exchange	12.2	20.7	38.3	57.5	68.2	83	92.9	106.3	121	135	148	174
Cyprus Stock Exchange	30.4	34.5	40.1	42.8	45.3	47.8	49.6	50.5	54.9	56.3	64.6	76.8
Deutsche Börse	132277.6	297572.2	565085.7	722610.3	869959.2	1055385	1190685	1298105	1435298.5	1569443.4	1742796.1	1884054.5
Euronext	167983	384938	722138	892042	1053847	1274521	1434448	1557225	1722424	1876264	2091222	2259800
Luxembourg Stock Exchange	3.9	7.9	14	16.9	20	23.2	26.2	28	31.6	35.9	42.3	47.3
Malta Stock Exchange	6.5	13.2	25.3	30.5	33.6	37.9	39.8	42.1	44.6	47.9	51.8	58.6
Nasdaq Nordics & Baltics	67779.9	149239.1	269016.1	342640.9	416830.7	500822.9	572169.4	632383.3	708641.4	784680.8	874618.9	948138.6
Prague Stock Exchange	290.4	760.5	1541	1993.2	2374.5	2888.2	3183.7	3405.1	3651.2	3918.5	4356.4	4717.3
Vienna Stock Exchange	2311.7	5382.7	10851.3	13409.7	15975.9	19548.5	21766.3	23605.2	25926.7	28298.5	31636.3	34391.1
Warsaw Stock Exchange	4476.3	8635.4	15953.2	21784.6	26791.8	33000.9	38865.6	43238.5	48521.2	59497.5	68127.4	76289.6

Appendice 15. Coronavirus monthly new cases during 2020.

(Compiled by the author based on FESE provided data)

Coronavirus cases	January	February	March	April	May	June	July	August	September	October	November	December
Athens Stock Exchange		4	1310	1277	326	492	1068	5840	8158	20776	66020	33579
BME		45	95878	117512	26044	9792	39251	174336	306330	416490	462509	280078
Bucharest Stock Exchange		3	2242	9995	7017	7713	23916	36654	40032	113767	234023	156901
Budapest Stock Exchange			492	2283	1101	279	350	1634	20322	48860	141801	105392
Bulgarian Stock Exchange			399	1107	1007	2476	6701	4576	4567	32011	92456	56966
Cyprus Stock Exchange			262	588	94	54	116	374	267	2611	6199	11454
Deutsche Börse	5	74	71729	91201	20401	12008	14981	34403	48111	238877	538122	690608
Euronext	5	118	92916	217248	51644	30716	44310	140276	398824	1448242	1368605	894664
Luxembourg Stock Exchange		1	2177	1606	234	281	2396	70	1884	8625	17544	11737
Malta Stock Exchange			169	296	153	52	154	1059	1175	2984	3831	2901
Nasdaq Nordics & Baltics	1	22	12546	31168	29342	47312	23944	18099	31870	113319	272630	433361
Prague Stock Exchange			3308	4374	1586	2686	4620	8044	46145	264339	188196	195363
Vienna Stock Exchange		9	10171	5272	1279	1035	3364	6308	17375	60112	177531	78359
Warsaw Stock Exchange			2311	10566	10909	10607	11295	21684	24142	271217	628080	304067