COMPARATIVE ANALYSIS OF HUNGARIAN AND ROMANIAN STOCK MARKET INDICES IN CONTEXT OF COVID-19

KULCSÁR Edina
Partium Christian University, Faculty of Economics and Social Science, Department of Economics, Oradea, Romania
kulcsar.edina@partium.ro

Abstract: *The coronavirus pandemic, erupted in 2019, re-emphasized the importance of dealing with risk and uncertainty. In addition to difficulties caused in public and health sectors, the negative consequences of COVID-19 outbreak are more and more obvious also in economy. The rapidly spread of virus from China to Europe and U.S., seriously tests the countries' ability to deal with such an unexpected situations, both health-wise and economically. As the same time, measures adopted by governments like travel restrictions have further amplify the difficulties in some aspects. In response to growing uncertainty, individuals have suddenly changed their consumer behaviour, manifested in excessive food purchases which caused certain food products shortage. Companies have restrained production and spending. Some categories of services are particularly affected, restaurants and hotel units temporarily fully suspended their activities. There are also serious transport restrictions, airlines cancelled several flights. The news of the outbreak of the novel coronavirus, the rapid spread worldwide, and the measures taken by governments, the panic reactions of individuals and companies, negatively impact the economic and financial stability. The negative effects caused by the coronavirus affect relatively quickly the financial markets, which show terrible volatilities. On March 18, 2020, the stock market prices declined more than 30% compared to the peak price value of recent years, which can be considered significant. Since the outbreak of the coronavirus pandemic, several articles deals with the impact of virus-induced uncertainty on volatility. The results related studies highlights the correlation between COVID-19 cases, deaths and different stock indices price volatility. Based on these, the aim of this article is to examine the relationship between the main stock indices, namely BUX and BET of two neighbouring countries in Central and Eastern Europe (Romania and Hungary) and the COVID-19 cases in European Union. In order to investigate this relationship we used simple linear regression. The results show that in both countries' stock indices case there is medium-strong correlation between BUX (R=0,6651), BET (R=0,6001) and COVID-19 European Union's cases. By investigation of stock indices changes in the analysed period we can conclude that the time of reaction of stock markets and the intensity of stock prices changes is quite different in case of BUX (36,27%) and BET (31,12%).*

Keywords: *risk; uncertainty; COVID-19; pandemic; financial crisis; stock market index; volatility.*

JEL Classification: *G01; G15; G18; G3; G30; G32.*

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

252

1. Introduction

Risk, uncertainty, instability and anxiety are features that can be well describe the present social and economic environment. The situation cause by coronavirus epidemic has strongly questioned the sense of security of world's population and also the preparedness of health sector for such a situation worldwide. In addition to the health and social consequences of the COVID-19 epidemic, the economic effects are also becoming more pronounced. The rapid spread of the epidemic on continents of the world, the published news about new infection cases and also the measures taken by governments have negatively affected the performance of various economic sectors such as transport, trading, manufacturing, international supply chains. In order to avoid a rapid increase of infections, governments have adopted measures regard to the free movement of persons and various workplaces shut down. The rapid spread of COVID-19 infections and the complete shutdown of some sectors which led to rising unemployment. The resulted panic and uncertainty also spill over into economy. In response to this situation, individuals changed their consumer habits e.g. excessive food purchase which caused serious shortage of certain products, especially in the food industry, companies slowdown their production, limited their spending and switch on the "wait-and see" mode. These reactions of population and companies have also negative impact on economic and financial stability at global level. The developed situation has seriously tested the ability of governments to deal with such an unexpected situations. The rapid increase in the number of new COVID-19 infections around the world, the rapid flow of negative news about this and as well the effects of government measures on companies and households had serious react overnight in some economic indicators such as e.g. unemployment rates, exchange rates and stock market indices. Previous research confirms that, with exception of Spanish influenza (1918-1920), no infectious disease had such a strong effect on the stock market as the COVID-19 pandemic (Baker et al., 2020). The Spanish influenza caused the death of 2% of the world population between 1918 and 1920 (Barro et al., 2020). Taking into account the strongly economic interconnected and integrated world, we consider that the consequences of current COVID-19 crisis will be more pronounced compared to previous epidemics as EBOLA, SARS, H1N1.

Taking into consideration the above mentioned aspects, the aim of this article is to examine the impact of European Union's COVID-19 infections cases on the main stock indices of two Central and Eastern European neighbouring countries (Hungary and Romania). Although many studies suggest that the negative effects of economic turbulences caused by COVID-19 will be present in the second half on year 2020, we consider that a short-term analysis of the situations occurred on stock exchanges is feasible.

2. Review of literature

COVID-19 (SARS-Cov-2) infectious disease appeared in Wuhan (Hubei region), China in December 2019 and then spread to America and Europe in January 2020.

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

253

The known characteristics of COVID-19 infectious disease are: highly contagious, spreads terribly quickly, it presents particularly high risk of death for certain age groups and there is no vaccine currently available against it. Aware of these characteristics and the news about rapid spread of new infections case caused panic and uncertainty in the social and public health areas around the world. As a reaction to severe quarantine situation in Italy, the governments of the Member States of the European Union have been taken serious measures regard to the free movement of persons manifested in mostly serious domestic and foreign travel restrictions. In order to avoid the rapid spread of new COVID-19 infection cases, both Hungary and Romania declared an emergency situation and also adopted travel restrictions. Government measures addressed to the public health crisis have also negative consequences on economies. Particularly affected are international trade, global production, supply chain networks. However, problems of these sectors have spilled over into financial markets, which serious negative effects can already present (Huang, 2020, p.1). With these measures, economies around the world have slowdown.

Panic and uncertainty related to the novel coronavirus have negatively impact the global economy as a whole. Several studies confirm that economically, the most affected state by the coronavirus is China. Multinational corporations such as General Motors, Nissan, Renault, Peugeot, Honda, Toyota stopped their production in China which can have serious economic consequences. (Zeren – Hizarci, 2020, p. 2). However, due to the uncertainty caused by the coronavirus, and in response to travel restriction measures of governments, some airlines have cancelled several international flights, especially those to the Far East. These can further increase economic and social tensions (Ahani - Nilashi, 2020, p. 1). The panic and insecurity feeling caused by COVID-19 pandemic, as well the negative consequences of the disease, are similar in magnitude with the 2008 global financial crisis. Given its protracted effects over time, it can be conclude that the negative effects will hardly be felt in the near future. In some sectors such as trade (local product shortages), production (factory closures), tourism, the entertainment industry, and aviation, the negative effects of the epidemic are already present. Services such as hotel and restaurant and production, mainly labor-intensive manufacturing industries are strongly affected (Huang et al., 2020, p. 10). Large companies such as Volkswagen and Ferrari suspended production in Europe, which negatively impact both on employment rate and GDP.

Based on these, it can be concluded, that the outbreak of novel coronavirus, its rapid spread worldwide and measures adopted by governments lead to serious economic consequences, which most likely will be materialize in a recession curve within 1-2 years, globally (Gourinchas, 2020). According to Gormsen and Koijen (2020) expectations in term of economic growth, the GDP of the European Union will fall by nearly 6.1% and the GDP of the United States by 8.2%. McKibbin and Fernando (2020) predict that globally, GDP will decline by 6.7% and in both the United States and the Eurozone, the GDP is expected to fall by 6.7% (McKibbin - Fernando, 2020).

The negative effects caused by coronavirus epidemic are relatively quickly felt on stock markets. The outbreak of COVID-19 in China, the rapid growth of new cases,

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

254

the fear and concerns of the disease, firstly, affected the Shanghai stock market, which fall 8% on February 3, 2020, followed by the U.S. S&P 500 which fall 4.4 % (Albulescu, 2020). As a result of its spread to European Union, South Korea (February 20), and as a consequences of the introduction of quarantine in Italy (February 22) stock market prices fall sharply. As a response to a travel ban to the EU introduced by the United States (on March 12), worldwide stock exchange prices fall by at least 10%. A week later (on March 18), stock markets fall more than 30% from their peak in recent years, causing a terrible volatility. The German's DAX, the UK FTSE 100 and the Euro Stoxx 50 also showed significant declines on 23 March, followed by a significant increase at the adoption of the European Union's rescue package (Nicola et al., 2020). Weaker performance than in the U.S. stock market prices was observed in the German, Spanish and UK stock markets. According to Gormsen and Koijen (2020) expectations, one of the most representative U.S. stock index, the S&P500 annual dividend will fall by 27%, while the European Union's Euro Stoxx 50 will fall by 37%, which can be considered quite significant (Gormsen – Koijen, 2020).

Hartwell (2018) considers that the main causes of significant volatility of financial instruments consists in development of economic conditions, institutional problems and market uncertainty. Macroeconomic news can also determine large fluctuations. According to Albulescu (2020) news about the spread of COVID-19 cases, as well the fear of illness have resulted in strong volatility in financial markets. Negative news has a particularly rapid and powerful effect. According to previous researches, news of spread of the virus from China to Europe resulted in greater volatility in stock markets worldwide, than in the Chinese stock market itself. The further spread of coronavirus to different countries further increased volatility. Since the outbreak of COVID-19, several articles deals with the impact of virus-induced uncertainty on volatility. Baker et al. (2020) examined the evolution of S&P500's volatility between 1900 and 2020. Their results suggest that the effects of COVID-19 on stock market volatility are quite significant, similar in magnitude to the Depression in 1933, the Black Friday in 1987, and to the 2008 global financial crisis. Compare to stock market effects caused by Ebola, SARS, H1N1 infectious diseases, the outbreak of COVID-19 resulted in severe stock market volatility (Baker et al., 2020, p. 5). Albulescu (2020) examined how the evolution of COVID-19 cases as well as the number of deaths affected the VIX (Chicago Board Options Exchange Volatility Index) financial market volatility index. He conclude that the mentioned independent variables significantly influence the evolution of the VIX volatility index. The results of Zeren and Hizarci's (2020) research shows that the evolution of COVID-19 cases, deaths is correlated with different stock market index prices in the world (SSE, KOSPI, IBEX35) (Zeren - Hizarci, 2020).

In contrast with these, other viewpoints suggest that the public health uncertainty, risk and high mortality rate caused by COVID-19 cannot be linked to the economic difficulties already present in these days. According to Ferdandes (2020), the reaction of Member States, the response embodied in concrete measures, the reaction of companies, consumers and the media to the existing emergency have greatly impact on the supply-demand balance, which spread to the world economy. This was inevitable in today's highly interconnected and integrated economies. The

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

255

fear of contracting the virus has changed consumers' behaviour and also negatively affected production. It has led to disruptions to the normal functioning of global supply chains, which had also a negative impact on companies. As in the 2008 crisis, both consumers and companies have suspended their spending and switch on "wait-and-see" mode (Baldwin - Weder di Mauro, 2020, p. 10). Millions of people have lost their jobs for a few months. According to Fernandes, all these led to significant volatility in financial markets at global level (Fernandes, 2020, p. 3).

Taking into consideration the above mentioned aspects, the aim of this article is to investigate the evolution and reactions of main stock market indices of two Central and Eastern Europe neighbouring countries (Hungary and Romania) and to examine the relationship between the mentioned stock indices and the European Union's COVID-19 cases. We chose this area because nowadays this is a topical issue and because the world's stock markets react quickly to the economic difficulties caused by the COVID-19 pandemic. Given that relatively short time has elapsed since the outbreak of this epidemic (nearly 5 months) the analysis of stock market data is the most feasible and daily data it still available yet. The economic effects of the uncertainty caused by COVID-19 are likely to be even more pronounced and investigable in the second half of 2020.

3. Research methodology

The comparative analysis of Hungarian and Romanian stock market indices contains more steps. Firstly, we determine the relationship between BUX (Hungary), BET (Romania) stock indices and EU's COVID-19 cases. Then we present the evolution of stock market indices and COVID-19 cases for the investigated period and also compute the main statistical features for the investigated indicators.

In this research, in order to determinate the relationships between – two neighbouring countries stock market indices (BET-Romania, BUX-Hungary) and European Union's COVID-19 cases, we used simple linear regression model. During the regression analysis, we want to analyse the impact of changes of the European Union's COVID-19 cases between January 1st, 2020 to April 16, 2020 on the main Romanian and Hungarian stock market indices, namely BET (Bucharest Exchange Trading) and BUX (Budapest Stock Exchange).

The analysis is based on European Union's cumulative daily COVID-19 cases, like daily data series, from January 1st, 2020 to April 16, 2020, as well as the selected countries main stock market indices for this period. The Romanian data referring to the exchange rate were collected from the databases of Bucharest Stock Exchange. The Hungarian data were also collected from databases Budapest Stock Exchange. The data reflecting the evolution of European Union cumulative COVID-19 cases were collected from official website of European Centre for Disease Prevention and Control (*https://qap.ecdc.europa.eu/*).

In order to test the goodness of fit of the regression models, we used coefficient of determination (R^2). The coefficient of determination reflects the part of the total variance explained by the created model (Andreß et al. 2013; Park, 2011). According to Hunyadi (2000) a very small value of coefficient of determination (R^2) indicates weak, poor fit of model which means that "the model has very little to do with reality".

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

256

The author notes that judging the usability and goodness of fit of the regression model cannot be rely only on the high values of coefficient of determination (R^2) but should be aware because very low coefficient of determination (R^2) value indicates that model is bad.

The statistical analysis was built on the R statistical software system, such as a solving program. In the R statistical system there are available all the packages (modules) which is necessary for this analysis. The R statistical system is open source software, that ensure many analysing, modelling and visualization facilities and another advantage is that it could be connected with other software, which facilitates the usage of different databases.

4. Results of research

In order to analyse the relationship between Hungarian stock market index, BUX and Romanian stock market index, BET and European Union's COVID-19 cases, we used simple linear regression. The regression model for the tested model is:

$$BUX = \beta_0 + \beta_1 * COVID + \varepsilon_i, \; ; BET = \beta_0 + \beta_1 * COVID + \varepsilon_i \quad (1)$$

where the question is how the changes of European Union's COVID-19 cumulative daily cases, can explain the evolution of BET, BUX stock indices. The calculated regression coefficient correspond essentially to the two countries stock market indices β coefficient, which shows that the daily COVID-19 cases changes explain the changes of BET and BUX index.

The mentioned regression analysis was carried out in the R statistical software system by using of '*lm*' function, and the results of computation are the regression function below:

$$BUX_i = 42040 - -0{,}0167 * COVID \; ; BET_i = 9486 - -0{,}00263 * COVID \quad (2)$$

For testing the goodness of fit of obtained regression's coefficient the software run the T-test and associated significance level, which values will be presented in the Table 1. and 2. By analysing the tables below, we can observe that in both case of BUX and BET index, the significance level for each coefficient value is around 0, which means that computed coefficients can be used successfully for describing relationship between two variables.

Table 1.: Estimation the parameters of BUX (Hungary) function

Statistical attributes	Estimation	Std. Error	T- value	Pr(>|t|)
Intercept	42040	561,9	74,82	< 2e-16 ***
Regression coefficient	-0,0167	0,0022	-7,55	1.02e-10 ***
Standard error of regression	4295			
R-squared (R^2)	0,4424			
Correlation coefficient (R)	0,6651			

Source: Own computation

Table 2.: Estimation the parameters of BET (Romania) function

Statistical attributes	Estimation	Std. Error	T- value	Pr(>|t|)
Intercept	9486	117	81,07	< 2e-16 ***
Regression coefficient	-0,00263	0,000419	-6,278	2,51e-08 ***
Standard error of regression	878,5			
R-squared (R^2)	0,3602			
Correlation coefficient (R)	0,6001			

Source: Own computation

By analysing the coefficients of determination (R^2), we can conclude that in case of BUX (0,4424) the dependent variable variance can be explained by independent variable in proportion of 44,24%, while in case of BET (0,3602), this is only 36,02%. This means, that in case of Romania, the evolution of European Union's COVID-19 cumulative daily case for investigated period can explain much less the BET. The above tables also presents the coefficient of correlation (R) which is 0,6651 in case of Hungarian BUX index and 0,6001 in case of Romanian BET index. By analysing these values we can conclude that in both cases there is a medium-strong correlation between stock indices and changes in European Union's COVID-19 case. The negative values of COVID coefficient in both of cases draw attention on the inverse relationship between changes in COVID-19 cases and the evolution of stock market indices, concretely the increase of COVID-19 EU's cases determine sharp fall in the prices of stock indices. This is not surprising, because most of stock market records significant price falling in this period.

By using R software we also performs the variance analysis, for both regression function and the results are presented in the Tables 3. and 4.

Table 3.: Variance-analysis / ANOVA table for BUX (Hungary)

	Degree of freedom	Sum of square	Mean of square	F-value	F-test Significance level
BUX	1	1054092347	1054092347	57.131	1.02e-10 ***
Error	72	1328427286	18450379		

Source: Own computation

Table 4.: Variance-analysis / ANOVA table for BET (Romania)

	Degree of freedom	Sum of square	Mean of square	F-value	F-test Significance level
BET	1	30415503	30415503	39.414	2.514e-08 ***
Error	70	54018605	771694		

Source: Own computation

The Tables 3-4. show us the deviation of Sum of Squares between original BET and BUX indices and the estimated indices values. Related with variance analysis, the F-test answer to the question if the model is acceptable in the sense that how well

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

258

the independent variables can explain the BET and the BUX index. The F-value is equal with: Mean Squares (BUX) / Sum Squares (Error). Because F- value's significance level in both of cases are very closed to 0, we can conclude that the explanatory variable effect is significantly greater than the error effect, so the regression model will be useful in the description of such a correlation. That means, we can reject the null hypothesis, so in both of cases, the variance of dependent variable can be well explained by the variance of independent variable. This is also suggested by '***' signs what means in both of cases the significance level are very closed to 0.

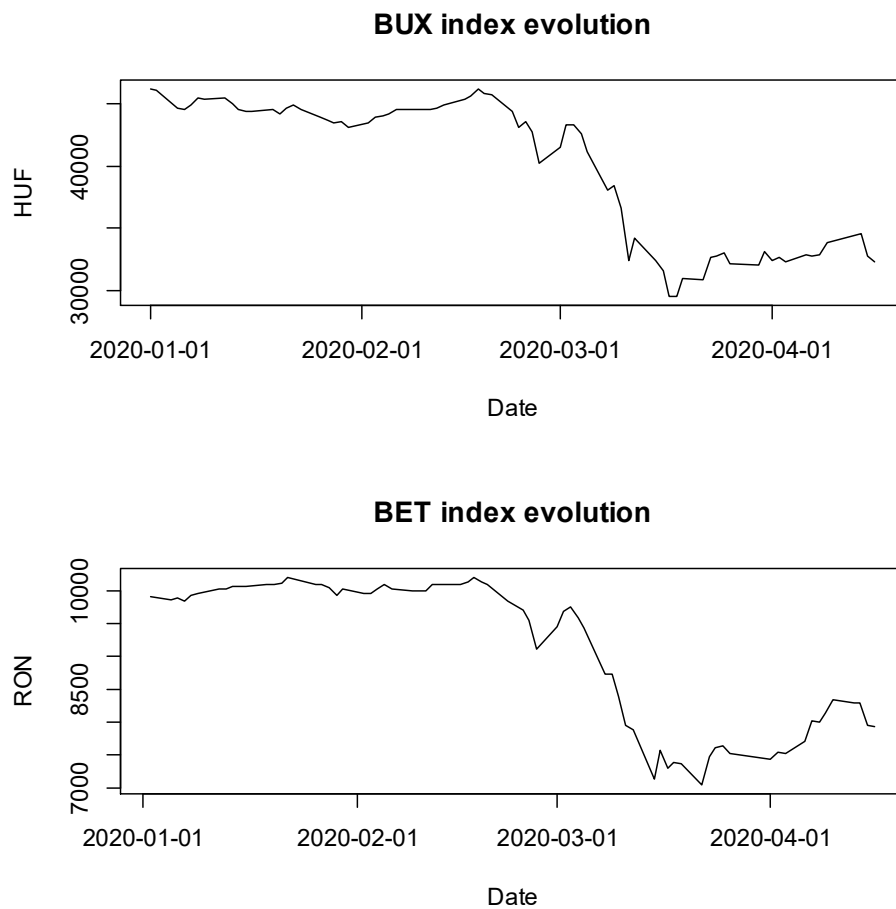The changes of BUX and BET index between January 1st and middle April are shown by Figure. 1.

BUX index evolution

BET index evolution

Figure 1: BUX and BET stock indices changes (1st January - 16 April 2020)
Source: own calculations using R statistical system

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

259

By comparing the graphs, similar trend can be observed at stock indices in the investigated period. Analysing the trends of the stock indices we can see that until the end of February, there are no significant changes in BUX and BET indices prices. The first significant and sharply price falling has recorded at the end of February, that could be probably linked with quarantine and beginning difficulties in Italy. As a result of mostly important stock market price changes, from the beginning to the middle of March, the BUX and BET also records the one of the largest decline from this year. Concretely in case of BUX the lowest value in the analysed period can be seen on March 18, which means 36,27% decrease from the peak value of this year recorded on January 1st. In case of Romanian BET, the largest volatility appears later, on March 23, which also means 31,12% falling from the peak value from investigated period recorded in January 23. It is obvious that the time of reaction of stock markets and the intensity of stock prices shock are quite different. In both of stock market index cases, these evolutions can be considered extremely compared with trends of recent years. At the end of March, after the adoption of the European Union's rescue package, slightly increase can be observed.

Table 5. presents the main statistical features of investigated indicators. During the analysis of the table, we can see that the interquartile range in case of all the investigated indicators is significant. This draws attention to a very large fluctuations in the investigated period, which also means high risk. In term of standard deviation on investigated indicators we can observe an extremely high value in case of COVID-19 cases in European Union, which is the consequence of large fluctuations in the investigated period. This can be explained with fact that at the beginning of January there was 0 registered COVID-19 infection cases in the European Union, so the extent of fluctuations is much greater. The coefficient of variance reflects the same situation. In comparison, slightly higher standard deviation and coefficient of variance values can be seen in case of BUX stock index than in case of BET index. Higher standard deviation, as well as coefficient of variance shows higher volatility, which also describes higher risk level.

Table 5. Main statistics of investigated indicators

Statistical feature	BUX	BET	COVID-19
Minimum	29464.28	7038.95	0.00
1. Quartile	32896.42	7991.09	9.50
Median	43411.06	9814.10	236.00
3. Quartile	44554.61	10039.47	87824.00
Maximum	46230.22	10219.75	852184.00
Mean	40095.93	9143.50	129885.63
Standard deviation	5712.90	1090.51	248312.03
Coefficient of variance	14.25%	11.93%	191.18%

Source: Own computation

The Figure 2. presents the evolution of COVID-19 infection cases from January 1st to April 16, 2020. The data on which this graph is based is daily cumulative European

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

260

Union's COVID-19 infection cases for above mentioned period. The COVID-19 extremely contagious infection disease appeared for first time in European Union on January 27, 2020. After a short time, as figure show us, the COVID-19 infections began to spread and the number of case increased rapidly.
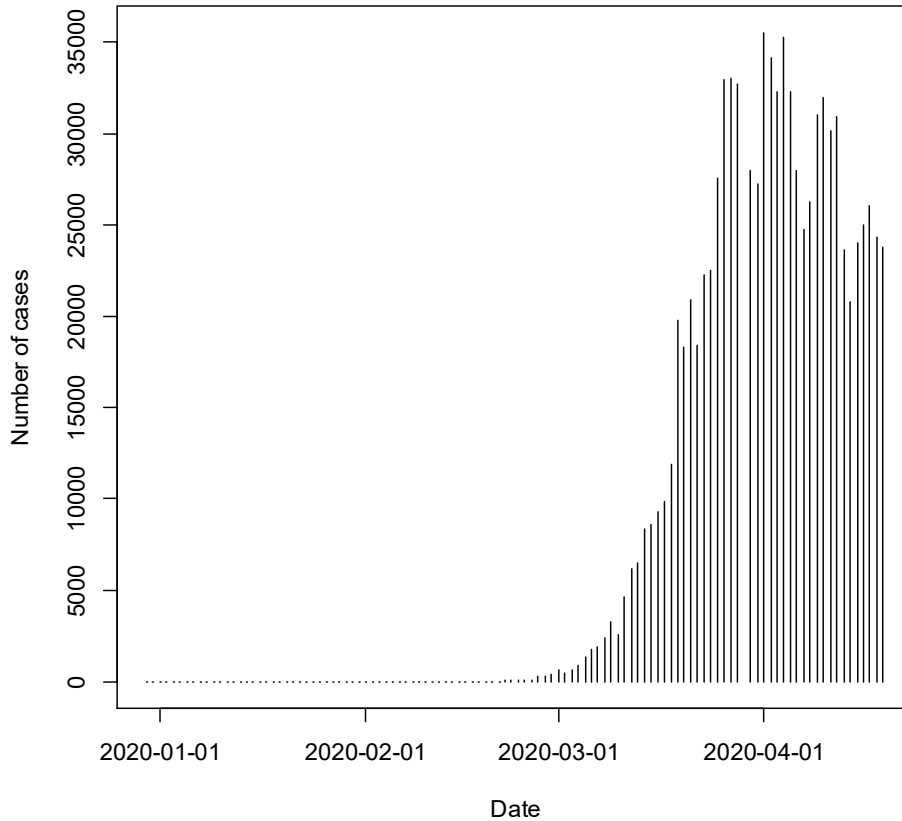

Figure 2. Evolution of European Union COVID-19 cases (January 1st - April 16, 2020)
Source: own calculations using R statistical system

By analysing the evolution of COVID-19 infections cases, sharply increase can be observed at beginning of March. On March 9, 2020 the number of COVID-19 infection cases have almost doubled, compared to previous day. Another significant increase in COVID-19 infection case was on March 16. We consider that this changes in both BUX and BET stock market indices prices can be well linked with the evolution trend of COVID-19 cases in European Union.

5. Conclusion

It is clear that the news of the outbreak of the novel coronavirus, the rapid spread of it worldwide, and the measures taken by governments, the panic reactions of households and companies, negatively impact the economic and financial stability. Although some of the negative effects are expected to be obvious only in time, the second half and following years, we can summarize that the effects experienced yet are significant. Some studies underline that the negative effects of this pandemic on economies will be more pronounced than in case of EBOLA, SARS, H1N1 epidemics. Taking into consideration the mostly interconnected and integrated world, we consider the expected effects will be probably exponentially.

As a response to economic imbalances, the stock markets worldwide immediately react and drew attention through significant level of volatilities. The most important and representative stock markets of U.S. (S&P 500) and European Union (Euro Stoxx 50) fell more than 30%.

The results of our empirical analysis shows that the investigated stock indices also react to worldwide changes caused by novel coronavirus. By analysing the evolution of two countries stock market indices (BUX and BET), we can observe that these are very similar. The time of reaction of stock markets indices are quite different, while the Hungarian BUX index record the minimum price value on March 18, the Romanian BET index price react only 5 days later, on March 23. The magnitude of volatility is almost quite different. In case of BUX (36,27%) greater fall can be observed compared with BET volatility shock intensity (31,12%). All these re-emphasized the importance of dealing with financial risk.

In term of relationship between stock indices and COVID-19 cases in European Union we can conclude that in both countries case there is medium-strong correlation between stock indices price BUX (R=0,6651), BET (R=0,6001) and the evolution of COVID-19 cases.

References

1. Ahani, A. and Nilashi, M. (2020): Coronavirus Outbreak and its Impacts on Global Economy: The Role of Social Network Sites, Journal of Soft Computing and Decision Support Systems, Vol.7 No.2 April 2020: 19-22.
2. Albulescu, C. T. (2020): Coronavirus and financial volatility: 40 days of fasting and fear, arXiv:2003.04005 [q-fin.CP]: Computational Finance (q-fin.CP); General Finance (q-fin.GN), March 2020.
3. Andreß, H.J. – Golsch, K. – Schmidt, A., W.(2013): Applied Panel Data Analysis for Economic and Social Surveys, Springer-Verlag Berlin Heidelberg 2013.
4. Baker, S. R., Bloom, N., Davis, S. J., and Terry, S. J.: COVID-Induced Economic Uncertainty, NBER Working Paper No. 26983, April 2020.
5. Baker, S. R., Bloom, N., Davis, S. J., Kyle J. K., Sammon M. C, Viratyosin, T. (2020): The Unprecedented Stock Market Impact of COVID-19, NBER Working Paper No. 26945
6. Baldwin R., Weder di Mauro, B. (2020): Mitigating the COVID Economic Crisis: Act Fast and Do Whatever It Takes, VoxEU.org Book, CEPR Press.

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

262

7. Barro, R. J., Ursua,J. F., Weng, J.(2020): The Coronavirus and the Great Influenza Pandemic – Lessons from the 'Spanish Flu' for the Coronavirus's Potential Effects on Mortality and Economic Activity," CESifo Working Paper No. 8166.

8. Fernandes, N.(2020): Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy, Available at http://dx.doi.org/10.2139/ssrn.3557504, March 22, 2020.

9. Gormsen, N. J. – Koijen, R. S. J (2020): Coronavirus: Impact on Stock Prices and Growth Expectations, VOX CEPR Policy Portal, March 23, 2020.

10. Gourinchas, P. O. (2020): Flattening the Pandemic and Recession Curves, Working Paper Haas Berkeley, 2020.

11. Hartwell, C.A., (2018): The impact of institutional volatility on financial volatility in transition economies. Journal of Comparative Economics, 46, 598-615.

12. Huang, Y., Lin, C., Wang, P.and Hu, Z. (2020): Saving China from the Coronavirus and Economic Meltdown:Experiences and Lessons, VoxEU eBook on COVID Economic Policy Response,, VOX CEPR Policy Portal, March 23, 2020.

13. Hunyadi L. (2000): A determinációs együttható. Statisztikai Szemle, 78(9): 753–765.

14. McKibbin, W., Fernando, R. (2020): The economic impact of COVID-19, in Economics in the Time of COVID-19, Weder di Mauro, B., VoxEU.org Book, CEPR Press.

15. Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, Ch., Agha, M., Agha R. (2020): The Socio-Economic Implications of the Coronavirus and COVID-19 Pandemic: A Review, International Journal of Surgery, https://doi.org/10.1016/j.ijsu.2020.04.018., IJSU 5409

16. Park, H., M. (2011): Practical Guides To Panel Data Modeling: A Step by Step Analysis Using Stata, International University of Japan, Public Management & Policy Analysis Program, Tutorial Working Paper., October 2011.

17. Zeren, F., Hizarci, A. E. (2020): The Impact Of Covid-19 Coronavirus On Stock Markets: Evidence From Selected Countries, Bulletin Of Accounting And Finance Review, 3, 1 (2020) 78 – 84.

The Annals of the University of Oradea. Economic Sciences
Tom XXIX 2020, Issue 1 (July 2020)
ISSN 1222-569X, eISSN 1582-5450 📖

263