https://doi.org/ 10.7251/EMC2101063E
UDK: 616.98:578.834]:330.101.541(4)
Datum prijema rada: 13. novembar 2020.
Submission Date: November 13, 2020
Datum prihvatanja rada: 14. jun 2021.
Acceptance Date: June 14, 2021
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XI** • Br./No. **I**
str./pp. 63-78

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

ECONOMIC RESPONSE OF THE EUROPEAN COUNTRIES TO THE FIRST WAVE OF COVID-19

Ognjen Erić | Assistant Professor; University of Banja Luka, Faculty of Economics; ognjen.eric@ef.unibl.org
Goran Popović | Full Professor; University of Banja Luka, Faculty of Economics; goran.popovic@ef.unibl.org
Jelena Bjelić | Doctoral student at University of Banja Luka, Faculty of Economics; Indirect Taxation Authority, Bosnia and Herzegovina; jelena.nemanjabj@gmail.com

Abstract: *COVID-19 pandemic has caused the deepest crisis since the World War II. Many countries have slid into recession due to continuous GDP fall. Lockdown has an impact on unemployment growth, while the provision of health systems and state aid to vulnerable sectors and population are deepening fiscal deficits. Based on the example of 31 European countries (27 EU members and several countries with which the Union has different agreements), this research determines impact of key economic and social variables in period of the First wave of COVID-19 pandemic on the "Economic stimulus", which is represented by composite index CESI. It is about a combination of variables: Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure, and Hospital Beds per Thousand People. Using the median method, the total sample has been divided into two groups, the one with less and the one with more infected people. The results of cross section regression analysis show that 52% variations in the Economic stimulus in the total sample is determined by predictor variables in the model. Analysis for the countries with less infected people shows that more than 75% variations in the Economic stimulus is determined by joint trends of the predictor variables, while the Analysis with more infected cases shows coefficient of determination (R^2) over 71%. In general, the results of econometric analysis unambiguously show that democracy contributes to the economic policy response to pandemic in all three observed cases. Stringency index contributes to democracy in an inversely proportional sense, especially in the case of countries with larger number of infected persons. The same could be said for the variable Final Consumption in the case of the total sample of countries, where markedly reduced final consumption requires stronger economic reaction and the governmental aid of all the countries included in the sample.*

Key words: *pandemic; COVID-19; Europe; GDP; economic stimulus..*

JEL Classification: *O52, F40, I15, H51.*

INTRODUCTION

At the start of 2020, the world was afflicted by the COVID-19 virus pandemic that soon turned into a global crisis. Most countries' economies slid into recession, the deepest one since the Great Depression. Alongside destructive consequences for health systems, the crisis has afflicted vital economic and social trends in most countries. Health economics has been jeopardised (Feldstein (2012), Phelps, (2018)), and the economic fall has put into jeopardy the always vulnerable fiscal stability. Old and new debts will create new difficulties in paying them back. Another consequence is unavoidable political interference in the economic system and ignoring of democratic standards. In a health sense, the world records a huge number of infected people, which, at the beginning of the fourth quarter, exceeds 40 million, and staggering 1 million deaths. In the European Union and Great Britain, there are around 4, 5 million infected people and 200.000 deaths.

In contrast to estimates from the end of the first biannual, health situation at the end of the last quarter of 2020 is drastically worsening. There "fail" numerous analyses from the first half of 2020, which foresee faster economic recovery on the basis of improvement in health situation. The deepening of the crisis in the fourth quarter disputes the estimates made by the World Bank from June 2020, to the effect that the fall in the global economic growth for 2020 will amount to 5,2% (World Bank, W.B., 2020). Given that the World Bank foresaw global growth by 2,5% at the start of 2020, the estimates are that the pandemic will knock down GDP by staggering 7,7% (World Bank, WB., 2020). The Eurozone should have an aggregate fall by 9,1%. The estimates have been made on the assumption that the pandemic will fade in the second half of the year. However, the escalation of COVID-19 in the last quarter of 2020 is worsening the actual estimates of economic growth for 2020 and the recovery in 2021. If the health situation does not improve, GDP in Europe and the world will additionally decrease. The recession is putting virtually all the countries into jeopardy, regardless of their state of development, size or geographic position. This crisis is almost three times deeper than the global recession from 2009 (World Bank, WB., 2020). According to data by ILO, lost work time in the second quarter of 2020 is equivalent to loss of almost 500 million work posts. These trends have been mildly improved in the second half of the year (International Labour Organization, 2020)

Regardless of the evaluations of the big drop in the economic activity, the first estimates are over-optimistic (including the WB Report). Certain sectors have virtually stopped, like, for example, tourism, air traffic, some branches of industry and so on. International exchange and export orders have dropped, too. UNCTAD estimates are such that trade will fall by 20% annually (UNCTAD, 2020), and similar ones are given by WTO (WTO, 2020). WB Report from the second quarter of 2020 discretely envisages mild recovery for the region of Europe and Central Asia Economic. The reason for this is the recovery of China, which records gradual economic growth since the second quarter of 2020 already. Still, these effects cannot alleviate the big drop in global GDP. In 2020, China will have growth by 1,6%, so that, due to the global fall, it will increase its share in the world GDP by 1,1% and thus achieve the share of 17,5% in the world GDP. At the same time, the USA and Europe's share in the world GDP will decrease.

World governments and global world institutions are making huge efforts to fight the COVID-19 pandemic. Politics is looking for less painful solutions to reduce

the number of deaths and at the same time ensure the economic and fiscal sustainability, which are so needed for paying enormous health costs. A huge problem for the functioning of economy is closure, which has proven to be efficient in fighting the pandemic. Flaxman, et al. (2020) investigate the consequences of non-pharmaceutical measures on the example of 11 European countries for the period from 14 February to 4 May 2020. They prove that non-pharmaceutical interventions and, in particular, closures, make a huge contribution to reducing the spread of the virus. Hence, they recommend continuity of interventions. On the other hand, the decision on closure faces governments with a dangerous choice between economic and health catastrophe. Still, national and global institutions are successfully solving various problems, regardless of the spread and duration of the pandemic. A notable improvement will come with the vaccine which the optimists expect already in the first quarter of 2021. And every relief for the health system, symbolical though it may be, contributes to the relaxation of the economic and fiscal sphere, and is an introduction to normalisation and stabilisation.

This paper researches the impact of a heterogeneous group of variables on the economic policies of selected countries; more precisely, it researches the impact of democratisation, stringency index, final consumption, gross investment, health expenditure, the number of hospital beds per thousand people on the variable that synthesizes the economic policy response to the crisis, in the form of the economic stimulus shown by CESI index. A sample of 31 European countries of varying levels of economic development and Euro integration has been selected. Besides 27 EU member states, several European countries with which the Union has trade agreements or agreements on stabilisation and accession have also been included in the sample. For example, Serbia is a candidate for EU membership and signatory to the Stabilisation and Accession Agreement with the EU; Norway and Switzerland are signatories of EFTA agreement and so on. Although it is not an EU member, Great Britain does not break the economic and political relations with the Union. The sample does not include candidate and Potential Candidate countries to become Candidates: Montenegro, Northern Macedonia, Albania, BiH and Kosovo (according to resolution 1244), due to unavailable data. The initial hypothesis is that the stated independent variables positively impact the CESI index. In that context, the countries are classified into two groups: with fewer and with more people infected in the sample. Econometric analysis using the method of cross section regression analysis will show interdependence between the observed variables in all three cases: the totality for all the countries, as well as the groups with fewer and more people infected out of the total sample. Consequently, the model contains five (5) explanatory variables: Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure and Hospital Beds per Thousand People, as well as one dependent variable which represents the Economic stimulus in the form of CESI index.

LITERATURE OVERVIEW

Global coronavirus pandemic has turned existing health and economic systems upside down, as only few countries have been spared. With the existing differences between health systems, COVID-19 pandemic has caused even greater divisions. This view is advocated by Stiglitz (2020) who states that different countries afflicted by the pandemic treat their citizens in different ways. The reasons for this are the fol-

lowing: inherited differences in health systems, health inequalities and the readiness of countries to undertake adequate measures. Stiglitz perceives the need for comprehensive reforms of economic rules (new economy, new rules). For, in many countries, the pandemic has unveiled weaknesses and increased differences. From the economic perspective, the crisis is mostly reflected in the fiscal system, which finds it harder and harder to pay the incurred health costs. At the same, collection of reduced fiscal income has been made more difficult. The Eurozone is suffering from great load, too. Thus, Haroutunian, et al. (2020) analyse measures by the European Commission (end of May 2020). In addition to classical measures, they recommend that Recovery Fund be established, in order for investments and structural reforms to enable balanced recovery. The state and measures in the area of public health are key in the prevention of the spread of the virus. Elgin, Basbug, & Yalaman (2020) use Principal Component Analysis-PCA and construct CESI index (COVID-19 Economic Stimulus Index). They create information base about this index for 166 countries. The primary source for constructing the CESI index is the IMF base, sub base for Economic policy response to COVID-19. CESI is a composite index that combines adopted economic measures, such as fiscal, monetary and currency measures. The database for CESI index represents the foundation for the dependent variable in this paper. Moran, Stevanovic, & Touré (2020)use structural VAR to calculate uncertainty shock impact on the Canadian economy. The results show that such shocks lead to huge economic fall, lower inflation and significant measures to adjust the monetary policy. There appear differences in the reaction of the economy, which depend on whether the shock stems from the American economy, or from internal disorders in the Canadian economy. In the former case, the shocks are deep and short-term, whereas in the latter, there occur weaker but long-term consequences for the Canadian economy. Goutte, Peran, & Porcher (2020) examine the role of economic-social factors in COVID-19 death rate. Focusing on a densely populated region in France, they prove that unemployment, poverty, lack of formal education and residence represent important factors that determine COVID-19 death rates. Milani (2020) evaluates global VAR model and uses the database on the existing social cross-border relations between the countries. He proves that social contacts, together with the spread of infection, contribute to the coronavirus risk perception, as well as to social distancing. In the early stages of the pandemic, coronavirus risk perception in most countries arises out of pandemic shock originating from Italy, whereby they confirm the set hypothesis. Raghupathi and Raghupathi (2020) use visual analytics, comparing the economic and health data from the official institutions for the economic analysis of the USA. Total results of the analysis indicate that there is a strong positive correlation between health care costs and economic indicators (income, GDP and work productivity). Therefore, there is a strong-intensity positive relation between investments in health and the indicators of work productivity, personal consumption and GDP. Kandel, et al. (2020) research 18 indicators (tools) from the reports of 182 member states IHR (SPAR). They have established huge differences in the countries' abilities to resist epidemics. Local processes are important for building the capacity and cooperation between countries. They serve to strengthen the global control over the pandemic. Smith and Nguyen (2013) research how to improve the health systems in the countries of Europe and Central Asia (ECA), comparing them to the situation in the EU member states before the big expansion (EU-15). They notice that ECA

countries today lag behind EU-15. They recommend guidelines and reforms that will make the health system of the whole region one of the best in the world. If countries with low and medium income erode the health system, lower the quality of nutrition, or if other shocks happen, resilience will fall and death rates, even among mothers and children, will increase. Therefore, Roberton, et al. (2020) suggest that in the times of the pandemic, policy creators bring guidelines, as well as optimally distribute national resources. Estimates are that the economic consequences of COVID-19 will be heavy, especially for tens of thousands of residents with lower and medium income. Bigger economic costs, loss of work posts and closures stimulate global poverty. Mahler, et al. (2020) claim that global poverty will grow due to the pandemic. They estimate the basic and negative scenarios. The former envisages decrease of the global growth by 5%, and negative by 8%. They find reasons for this in the vulnerability of companies and reduced household consumption, which is why more and more countries with low and medium income will have new and larger financial shocks.

MATERIAL AND METHODOLOGY

Methodology

For the assessment of connection between variables, set hypotheses and conclusions, cross-sectional regression is used. It has been said that the sample includes 31 European country. In the first phase, median method is used to divide the total sample into the countries with less and more infected cases. Then, cross-sectional regression analysis is applied to data grouped in this way. In statistics and econometrics, a cross-sectional regression is a type of regression in which the explained and explanatory variables are all associated with the same single period or point in time. This type of cross-sectional analysis is in contrast to a time-series regression or longitudinal regression in which the variables are considered to be associated with a sequence of points in time (Andrews, 2005). Multiple linear regression model with cross-sectional data is used to evaluate the relationship between dependent and explanatory variables. The aim of this method is to explore the linkages between variables and to quantify the statistical significance of certain variables. Regression model is the one that shows average composition of variation of investigated incidence. Multiple regression model has the following equation(Koop, 2003):

$$Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_k X_k + \varepsilon \quad (1)$$

where X - means independent variable, Y - dependent variable, β - regression parameter and ε is residual. The aim of regression analysis is to predict some values of Y (dependent variable, in this research it is Economic stimulus), for certain value of X (independent variables, in this research these are *the Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure, Hospital Beds (per 1,000 People*).

Ordinary least square (OLS) method minimizes squares sum residual in order to estimate the unrecognized parameters in the sample. Furthermore, the OLS method estimates and minimizes the sum of squared residuals. The estimation of β1 and β2 is interpreted so that Y (dependent variable) could be predicted with the change of X_1 and

X_2. The reliability of the model was accepted on the p-value and R square (adjusted R square). The p-value should be less than 0.05 (in some estimation the level could be higher - 0.10 or 0.15). Higher value of adjusted R square means that the model is more reliable.

Sources of data and explanation of variables in the model

The following table shows an overview and basic data on the variables used in the model.

Table 1. Dependent and Explanatory variables for the analysis and data sources

Variable	Mark in the model	Source
(A) Dependent variable		
Indeks ekonomskog stimulusa	CESI	Created Elgin, et al. (2020) with source Financial Access COVID-19 Policy Tracker, International Monetary Fund (2020)
(B) Explanatory variables		
Democracy Index 2019	DEMOCR	The Economist Intelligence Unit
Stringency index 2020	STRINGENCY	Our World in data, 2020
Final Consumption	CONSUMP	Eurostat, 2nd quarter of 2020
Gross investment	GINVEST	Eurostat, 2nd quarter of 2020
Health expenditure (2017)	HEALTHINV	World bank – WDI
Hospital beds per thousand (2017)	BEDS	Our World in data, 2020

Source: Created by the authors, using data from Elgin et al (2020), International Monetary Fund-IMF (2020), World Development Indicator- WDI (2017), Economist Intelligence Unit (2020), Our World in data - Hospital beds (2020), Our World in data- Stringency index (2020), Eurostat-Final Conumption, (2020), Eurostat-Gross investment (2020).

1. COVID-19 Economic Stimulus Index (CESI). This is a composite index that combines all the adopted economic measures due to the occurrence of COVID-19 pandemic (fiscal, monetary and currency rate interventions). Elgin et al (2020) use the Principal Component Analysis-PCA and construct CESI index. Higher index value signifies stronger measure of economic policy for every country. The primary data source for constructing CESI index is the IMF base, sub base for Economic policy response to COVID-19. CESI index base is the basis for the dependent variable in this research.

2. The Democracy Index is an index compiled by the Economist Intelligence Unit (EIU), a UK-based company. It intends to measure the state of democracy in 167 countries, of which 166 are sovereign states and 164 are UN member states. The democracy index is a weighted average based on the answers of 60 questions, each one with either two or three permitted alternative answers. Today, democracy is brought into connection with the economic growth and welfare. Their interdependence is mainly observed through the following dilemmas: Does (and to what extent) democracy stimulate or limit faster economic growth? (Ghardallou & Sridi, 2020)

3. Stringency Index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value

from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.

4. Final Consumption or Private Final Consumption Expenditure includes households and Non-Profit Institutions Serving Households final consumption expenditure. Data are calculated as chain-linked volumes. Growth rates with respect to the same quarter of the previous year are calculated from raw data.

5. Gross fixed capital formation (GFCF), also known as Gross Investments, consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets. Data are calculated as chain-linked volumes. Growth rates with respect to the previous year are calculated from raw data.

6. Health Expenditure. This variable refers to current expenditures on health per capita in current US dollars. Estimates of current health expenditures include healthcare goods and services consumed during each year.

7. Hospital Beds (per 1,000 People). Hospital beds include inpatient beds available in public, private, general, and specialized hospitals and rehabilitation centres. In most cases beds for both acute and chronic care are included. Our World in data, 2020.

RESULTS

Results of descriptive analysis

The first phase makes use of the median method to divide the countries into the groups with less and groups with more infected people. Then, cross section regression analysis is applied in three cases: total sample (all the countries), the group of countries with less infected people, and the group with more infected people. Dependent variable is the Economic stimulus shown by way of the CESI index, and the explanatory variables are: Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure, and Hospital Beds per Thousand. The first group with less infected cases mostly comprises the countries of Eastern Europe, whereas the second group includes founder and other member states that are economically more developed, which is shown in the next table:

Table 2. Confirmed number of infected people per million residents (June 30, 2020)

Country	Fewer infected people -left of Median	Country	More infected cases -right of Median
Slovakia	305	Norway	1633
		Austria	1961
Greece	325	Serbia	2100
Hungary	429	Denmark	2201
Latvia	592	Germany	2319
Croatia	664	France	2516
Lithuania	667	Netherlands	2931
Bulgaria	695	Switzerland	3648

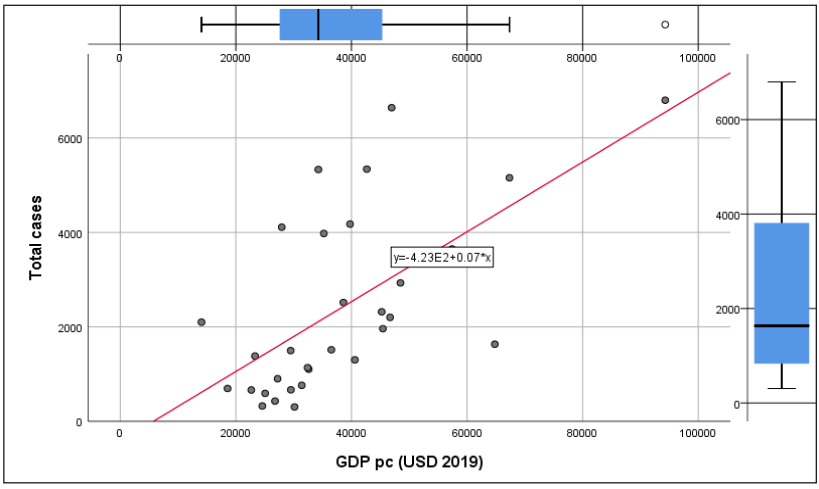
Slovenia	762	Italy	3977
Poland	902	Portugal	4110
Czech Republic	1102	United Kingdom	4177
Cyprus	1137	Ireland	5157
Finland	1301	Spain	5331
Romania	1382	Belgium	5340
Estonia	1498	Sweden	6640
Malta	1515	Luxembourg	6799

Source: Our World in Data (2020).

Table 2 provides an overview of COVID-19 infected cases per million residents. It can be seen that the group with less infected people (Left Median) mainly comprises eastern, central and southern European countries. They are mostly EU members from later expansions and mainly have lower level of economic development.

Graph 1 reveals rising regression line. Due to certain reasons, countries with higher GDPpc had larger number of infected cases. The assumption is that the countries which have higher level of development are less closed, that the interaction between residents (work, school, institutions) is greater, which is why they are more exposed to the pandemic. An additional assumption is that countries of central and Eastern Europe used to invest more in public health, in relation to the "old" developed Europe. Thus, for example, the population was vaccinated against different types of virus *en masse*, which could have impacted lower rates of infection.

The following graph shows that variables are mainly scattered around the regression line. Larger number of countries with lower income (20.000-40.000 USDpc) records lower relative rate of infection, while several richer countries (60.000-100.000 USDpc) have a high degree of infection.



Graph 1. The relationship between the number of infected people per million residents and GDPpc

Source: Authors calculation in SPSS

Regression analysis results - Total sample

What follows are results of the regression analysis where the total sample of 31 countries is included. The first section of the regression model (Model Summary) shows the determination coefficient (R Square) 0,52, which means that 52% variations in the Economic stimulus is determined by joint trends of the predictor variables in the model. The result is acceptable from the point of view of statistical analysis, in the sense of significance and model quality. Statistical significance of the model is also confirmed by the results of F test in the second section of the regression analysis (variance analysis – ANOVA), with the value 4,3 and probability below 5%.

Table 3. Total Sample - Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Df 1
1	.722[a]	.522	.402	.887	6

[a] Dependent Variable: CESI Index
[b] Predictors: (Constant) Democracy Index 2020, Stringency Index, Hospital Beds per Thousand People, Final Consumption, Gross Investment, Health Expenditure

Source: Authors calculation in SPSS

Table 4. Total Sample - ANOVA[a]

Model	Sum of Squares	df	Mean Square	Sig.
Regression	20.579	6	3.43	0.04[b]
Residual	18.867	24	.786	
Total	39.446	30		

Source: Authors calculation in SPSS

The third section (Coefficients) shows coefficients of regression predictors and their respective significance for the dependent variable trend in 31 European country. Variable Democracy Index 2020 positively and statistically significantly determines the economic stimulus (CESI index). Change in Democracy Index by one unit positively determines the Economic stimulus trends by 0,129 units. This points to the conclusion that in the countries with higher degree of democracy one can expect stronger economic responses to pandemic shocks. A similar conclusion holds for the independent variables - Final Consumption, Health Expenditure and Hospital Beds per Thousand People, while individual coefficients of independent variables Stringency Index and Gross Investment are not statistically significant for the dependent variable trends.

Table 5. Total Sample - Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
Del	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	-9.352	2.795		-3.346	.003
Democracy Index 2020	.129	.037	1.233	3.502	.002
Stringency index	-.026	.013	-.283	-1.897	.070
Final Consumption	-.088	.033	-.433	-2.676	.013
Gross investment	-.016	.012	-.203	-1.303	.205
Health expenditure	.000	.000	-.803	-2.448	.022
Hospital beds per thousand	.287	.121	.421	2.372	.026

[a] Dependent Variable: CESI Index

Source: Authors calculation in SPSS

Regression analysis results - countries with fewer infected people

In the first section of the regression model (Model Summary), where countries with fewer infected people are grouped, the determination coefficient (R Square) amounts to 0,751, meaning that more than 75% variations in the Economic stimulus (CESI index) is determined by joint trends of the predictor variables in the model. The result is acceptable from the point of view of statistical analysis, in the sense of the significance and quality of the model. Statistical significance of the model in the second section (variance analysis – ANOVA) shows that the F test result is 3,52 and the probability is somewhat higher than 5%, and they are outside the acceptability ranges. The indicator is logical if it is compared to the previous model, because it includes smaller number of countries from the first half of the median. Those countries have greater variability and lower freedom degree in variations among the phenomena.

Table 6. Fewer infected cases - Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	df1
1	.867[a]	.751	.538	.4282	6

[a] Dependent Variable: CESI Index
[b] Predictors: (Constant) Democracy Index 2020, Stringency Index, Hospital Beds per Thousand People, Final Consumption, Gross Investment, Health Expenditure

Source: Authors calculation in SPSS

Table 7. Fewer infected cases ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.874	6	.646	3.522	.062[b]
	Residual	1.283	7	.183		
	Total	5.157	13			

[a] Dependent Variable: CESI Index
[b] Predictors: (Constant) Hospital Beds per Thousand, Stringency Index, Final Consumption, Gross Investment, Democracy Index 2020, Health Expenditure

Source: Authors calculation in SPSS

The third section shows the coefficients of regression predictors and their respective significance for the dependent variable trends for countries with less infected people. Variable Democracy Index 2020 is positive and statistically significantly determines the economic stimulus trends (statistical significance below the 5% cut-off value). Change in Democracy Index by one unit positively determines the Economic stimulus by 0,079 units. The conclusion is that countries with fewer infected people also have lower level of democracy (in relation to the total sample). And the lower number of registered cases, together with the lower level of democracy, cause weaker reaction of the economic stimulus in those countries. Alongside Democracy Index, the only independent variable that is significant for the dependent variable trends is investing in health. Variables Final Consumption, Hospital Beds per Thousand People, Stringency Index, and Gross Investment are not statistically significant for the dependent variable trends in the regression model.

Table 8. Fewer infected cases - Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.893	2.792		-.678	.520
Democracy Index 2020	.079	.030	1.023	2.685	.031
Stringency index	-.013	.017	-.175	-.763	.470
Final Consumption	-.027	.037	-.196	-.713	.499
Gross investment	-.001	.019	-.015	-.044	.966
Health expenditure	-.001	.000	-1.179	-2.453	.044
Hospital beds per thousand	-.286	.228	-.623	-1.255	.250

[a] Dependent Variable: CESI Index

Source: Authors calculation in SPSS

Regression analysis results – countries with more infected cases

This model shows regression analysis for countries with more infected cases. In the first section of the regression model (Model Summary), the determination coefficient (R Square) amounts to 0,714, meaning that over 71% variations in the Economic stimulus (CESI) is determined by joint trends of predictor variables in the model. The result is acceptable in the sense of significance and quality of the model. Statistical significance is also confirmed by the F test results of 4,157 and probability below 5% in the variance analysis in the second section of the regression analysis (ANOVA).

Table 9. More infected cases - Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.845[a]	.714	.542	.931

[a] Dependent Variable: CESI Index

[b] Predictors: (Constant) Democracy Index 2020, Stringency Index, Hospital Beds per Thousand People, Final Consumption, Gross Investment, Health Expenditure

Source: Authors calculation in SPSS

Table 10. More infected cases - ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.628	6	3.605	4.157	.023[b]
	Residual	8.672	10	.867		
	Total	30.300	16			

a. Dependent Variable: CESI Index
b. Predictors: (Constant) Hospital Beds per Thousand People, Health Expenditure, Gross Investment, Stringency Index, Final Consumption, Democracy Index 2020

Source: Authors calculation in SPSS

The third section shows the coefficients of regression predictors and their respective significance for the dependent variable trends, for the countries with more than 50% infected cases. Variables Democracy Index 2020, Hospital Beds per Thousand People positively and statistically significantly determine the economic stimulus trends. Change in Democracy Index by one unit positively determines the Economic stimulus by 0,247 units. The conclusion is that the countries from the sample with more infected cases have higher levels of democracy. Furthermore, there is a significant impact and higher values of coefficients in determining the dependent variable trends (CESI index). More infected cases, higher degree of democracy and lower stringency index cause stronger reaction of the economic stimulus in those countries. Alongside Democracy Index and Stringency Index, Hospital Beds per Thousand People and Health Expenditure are also significant variables for the dependent variable trends.

Table 11. More infected cases - Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-14.821	4.105		-3.610	.005
	Democracy Index 2020	.247	.065	1.732	3.820	.003
	Stringency index	-.055	.019	-.574	-2.894	.016
	Final Consumption	-.050	.059	-.197	-.857	.412
	Gross investment	-.013	.019	-.152	-.677	.514
	Health expenditure	-.001	.000	-1.601	-3.451	.006
	Hospital beds per thousand	.427	.147	.534	2.903	.016

[a] Dependent Variable: CESI Index

Source: Authors calculation in SPSS

DISCUSSION AND CONCLUSION

In addition to enormous number of people infected and those who died, the global pandemic caused by COVID-19 virus has brought the world on the brink of economic catastrophe. At the start of 2020, the pandemic rapidly spread from China to Europe, USA and the whole world. The fall of GDP and investments, the growth of unemployment and debts, are only some of the negative reflections on the economic system.

Lockdown and other non-pharmaceutical measures, as well as increase in expenditures for health care, have additionally worsened the economic situation in all the countries of the world. Logically, there ensued decisive and fast responses on the part of many countries, which have mainly been created by national governments on the basis of recommendations by WHO (2020). Undertaken measures are more or less successful, which is testified by the results of the research for 31 European country.

Analysis of the relationship between the number of infected people per one million citizens and GDPpc shows that the majority of countries with lower income have lower rate of infection, while several richer countries have been infected more. This is interesting as much as indicative data. Also, the division into two groups represents the basis for researching the impact of selected economic-social variables on the variable Economic stimulus, which has been represented by way of composite index CESI.

The results of regression analysis on the sample of all 31 European country show that Democracy Index positively and statistically significantly impacts the economic stimulus (that is, the CESI index). Change in Democracy Index by one unit causes positive reaction to Economic stimulus by 0,129 units. Hence, more democratic countries give stronger economic response to pandemic shocks. Similar holds for Final Consumption, Health Expenditure and Hospital Beds per Thousand People. Variables Stringency Index and Gross Investment are not statistically significant.

The results for the group of countries with fewer infected cases show that democracy has positive and statistically significant impact on the economic stimulus. Change in Democracy Index by one unit causes positive reaction to Economic stimulus by 0,079 units. The group of countries with lower level of democracy has lower infection rates. Hence, lower number of registered cases and lower level of democracy have caused weaker reaction of the economic stimulus in these countries. Apart from the Democracy Index, investment in the health sector is significant too, whereas Final Consumption, Hospital Beds per Thousand People, Stringency Index, and Gross Investment are not statistically significant.

In the group of countries with more than 50% infection rate, democracy and the number of hospital beds per thousand people have positive and statistically significant impact on the economic stimulus. Change in Democracy Index by one unit causes positive reaction of Economic stimulus by 0,247 units. The group of countries with more infected cases has higher level of democracy and is significant from the aspect of impact on CESI index. More infected cases, higher degree of democracy and lower stringency index cause stronger reaction of the economic stimulus. Likewise, the number of hospital beds per thousand people and health expenditure are significant in relation to the economic stimulus.

In general, the results show that the state of democracy impacts the economic policy responses to the pandemic, that is, it contributes to the response to COVID-19

in all the cases observed. In contrast, stringency index has an inversely proportional impact on democracy, especially in countries with more infected cases. Furthermore, variable Final Consumption in the total sample, where final consumption has been significantly reduced, requires stronger economic reaction and aid from the governments of the countries in the sample. It is obvious that the observed variables (for all the observed groups of European countries) impact on CESI index, as well as on GDP, that is, they relevantly represent economic and wider social responses to the COVID-19 pandemic.

Economic and social damage caused by the COVID-19 pandemic is enormous. The hardest one is that in human lives, but we must not forget shocks that have led to unprecedented GDP fall, unemployment growth, indebtedness, fall in investments, financial instability and the like. Numerous economic sectors have been drastically afflicted, company profits jeopardised, and the same holds for household and individual income. Analyses from the first half of the year had envisaged stabilisation of the health situation and the beginning of economic recovery. However, events from the last quarter do not awake optimism. Not even better results achieved by China are sufficient to alleviate recession and fall in global GDP by 5,25%. The economic and wider social crises caused by the COVID-19 pandemic will be felt in the world for many years to come.

REFERENCES

Andrews, D. W. (2005). Cross-section regression with common shocks. *Econometrica, 73*(5), 1551-1585. doi:10.1111/j.1468-0262.2005.00629.x

Economist Intelligence Unit. (2020). *Democracy Index 2019. A year of democratic setbacks and popular protest.* London: EIU. Retrieved from http://www.uilpamagazine.com/wp-content/uploads/2020/06/Democracy-Index.pdf

Elgin, C., Basbug, G., & Yalaman, A. (2020). Economic policy responses to a pandemic: Developing the COVID-19 economic stimulus index. *Covid Economics, 1*(3), 40-53. Retrieved August 22, 2020, from http://www.amcham-egypt.org/bic/pdf/corona1/Covid%20Economics%20by%20CEPR.

Eurostat, Final consumption expenditure of households and NPISH. (2020, August 15). Retrieved from Eurostat: https://ec.europa.eu/eurostat/databrowser/view/teina021/default/table?lang=en

Eurostat, Gross fixed capital formation, current prices. (2020, August 01). Retrieved from Eurostat: https://ec.europa.eu/eurostat/databrowser/view/teina040/default/table?lang=en

Feldstein, P. J. (2012). *Health care economics. 7th Edition.* Delmar Cengage Learning.

Flaxman, S., Mishra , S., Gandy, A., Unwin, H. J., Mellan, T. A., & Monod, M. (2020). Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe. *Nature, 584*(7820), 257-261. doi:10.1038/s41586-020-2405

Ghardallou, W., & Sridi, D. (2020). Democracy and economic growth: a literature review. *Journal of the knowledge economy, 11*(3), 982-1002. doi:10.1007/s13132-019-00594-4

Goutte, S., Peran, T., & Porcher, T. (2020). The role of economic structural factors in determining pandemic mortality rates: evidence from the COVID-19 outbreak in France. *Research in International Business and Finance, 101281*(54). doi:10.1016/j.ribaf.2020.101281

Haroutunian, S., Hauptmeier, S., & & Leiner-Killinger, N. (2020). The COVID-19 crisis and its implications for fiscal policies. *ECB Economic Bulletin - Boxes*(4), 76-80. Retrieved

from https://www.ecb.europa.eu/pub/pdf/ecbu/eb202004.en.pdf

IMF- International Monetary Fund. (2020, September 20). *Financial Access COVID-19 Policy tracker the key economic responses governments*. Retrieved from Policy Responses to COVID-19: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

International Labour Organization. (2020, September 2). *ILO Monitor: COVID-19 and the world of work. Fifth edition Updated estimates and analysis.* Retrieved from https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_749399.pdf

Kandel, N., Chungong, S., Omaar, A., & Xing, J. (2020). Health security capacities in the context of COVID-19 outbreak: an analysis of International Health Regulations annual report data from 182 countries. *The Lancet*, 1047-1053. doi:10.1016/S0140-6736(20)30553-5

Koop, G. (2003). *Bayesian Econometrics.* Chichester, West Sussex, England: John Wiley & Sons Ltd, The Atrium.

Mahler, D. G., Lakner, C., Aguilar, R. A., & Wu, H. (2020). *Updated estimates of the impact of COVID-19 on global poverty.* World Bank. World Bank. Retrieved from https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty

Milani, F. (2020). COVID-19 Outbreak, Social Response, and Early Economic Effects: A Global VAR Analysis of Cross-Country Interdependencies. *Journal of Population Economics, 34*, 223-252. doi:10.1007/s00148-020-00792-4

Moran, K., Stevanovic, D., & Touré, A. K. (2020, September). *Macroeconomic Uncertainty and the COVID-19 Pandemic: Measure and Impacts on the Canadian Economy.* Centre de recherche sur les risques les enjeux économiques et les politiques publiques. CRREP. Retrieved from http://www.crrep.ca/sites/crrep.ca/files/fichier_publications/2020-11.pdf

Our World in Data. (2020, August 15). *Daily confirmed cases per million*. Retrieved from Our World in Data: https://ourworldindata.org/grapher/covid-daily-vs-total-cases-per-million?tab=table&time=2020-01-22..2020-10-03

Our Worlds in data. (2020, October 3). *Government Response Stringency Index*. Retrieved from Our World in data: https://ourworldindata.org/grapher/government-response-stringency-index-vs-biweekly-change-in-confirmed-covid-19-cases?tab=table&time=latest

Our Worlds in data. (2020, October 3). *Hospital beds (per 100,000)*. Retrieved from Our World in data: https://ourworldindata.org/grapher/hospital-beds-per-1000-people?tab=table

Phelps, C. E. (2018). *Health economics* (6th ed.). Routledge.

Raghupathi, V., & Raghupathi, W. (2020, May 13). Healthcare Expenditure and Economic Performance: Insights From the United States Data. *Frontiers in Public Health, 8*(156), 1-15. doi:10.3389/fpubh.2020.00156

Roberton, T., Carter, E.D., Chou, V., Stegmuller, A. R., Jackson, . . . & Walker, N. (2020, July 1). Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. *The Lancet Global Health, 8*(7), e901-e908. doi:10.1016/S2214-109X(20)30229-1

Smith, O., & Nguyen, S. N. (2013). *Getting Better: Improving Health System Outcomes in Europe and Central Asia.* World Bank . Washington: World Bank . doi:10.1596/978-0-8213-9883-8.

Stiglitz, J. (2020, September 1). Conquering the Great Divide The pandemic has laid bare deep divisions, but it's not too late to change course. *Finance & Development*, 17-19. Retrieved 2020 2020, from https://www.imf.org/external/pubs/ft/fandd/2020/09/pdf/COVID19-and-global-inequality-joseph-stiglitz.pdf

UNCTAD, U. N. (2020). *From Global pandemic to Prosperity for all: avoiding another lost*

Decade. New York: United Nations Conference on Trade and Development - UNCTAD. doi:https://unctad.org/system/files/official-document/tdr2020_en.p

World Bank, W.B. (2020). *The COVID-19 Pandemic : Shocks to Education and Policy Responses, Washington, DC.* Washington: World Bank. Retrieved from World Bank - Wb: https://openknowledge.worldbank.org/handle/10986/33696

World Bank, WB. (2020). *The Human Capital Index 2020 Update : Human Capital in the Time of COVID-19.* Washington: World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/34432

World Bank, WB. (2020). *Protecting People and Economies : Integrated Policy Responses to COVID-19.* Washington: World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/33770

World Development Indicator- WDI. (2017). *Current health expenditure per capita (current US$)*. Retrieved September 8, 2020, from The World Bank data: https://data.worldbank.org/indicator/SH.XPD.CHEX.PC.CD

(WHO), W. H. (2020). *Country capacity assessment, monitoring, evaluation and planning update.* Geneva: WHO-IHR: WHO-IHR. Retrieved July 9, 2020, from extranet.who.int/sph/docs/file/4122