The Need for a Danube Post-Covid 19 Strategy for Economic Survival

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Abstract: EU27 is facing to a new crisis generated by the Covid-19 pandemic. This crisis is different from the previous ones because it achieved a maximum degree of complexity. The specialists point out as components of this crisis: social, political, medical and economic elements. As a result, EU27 is expected to decrease its GDP growth rate by 7.4% in 2020 following the outbreak of the Covid-19 (Clark, D., 2020). A forecasted economic recovery in 2021 will be not able to balance the present economic recession in the EU27.

Keywords:

1. Introduction

EU27 is facing to a new crisis generated by the Covid-19 pandemic. This crisis is different from the previous ones because it achieved a maximum degree of complexity. The specialists point out as components of this crisis: social, political, medical and economic elements. As a result, EU27 is expected to decrease its GDP growth rate by 7.4% in 2020 following the outbreak of the Covid-19 (Clark, D., 2020). A forecasted economic recovery in 2021 will be not able to balance the present economic recession in the EU27 (see Figure 1).

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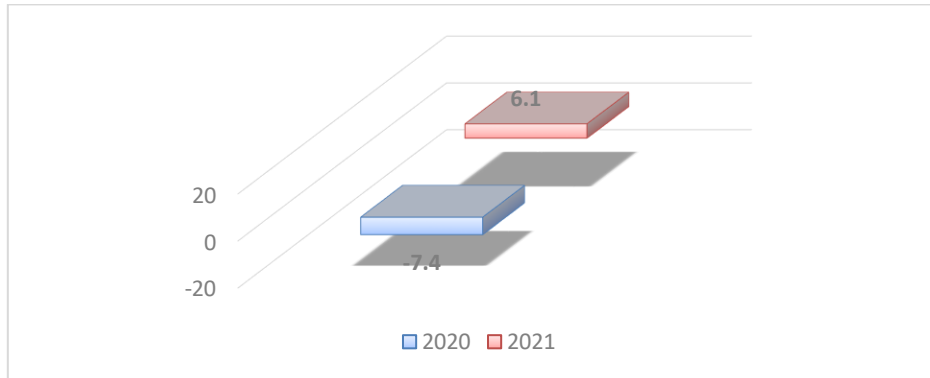
Figure 1. Real GDP growth rate forecast (%)

According to Figure 1, the forecasted economic recovery in 2021 will be not enough to cover the decrease from 2020.

The EU Danube Member States are facing to the same situation connected to the pandemic's impact in 2020. The effects of the pandemic on these economies varies a lot. The decrease in real GDP in 2020 achieves 9.1% in Croatia, compared to 5.5% in Austria (see Figure 2).
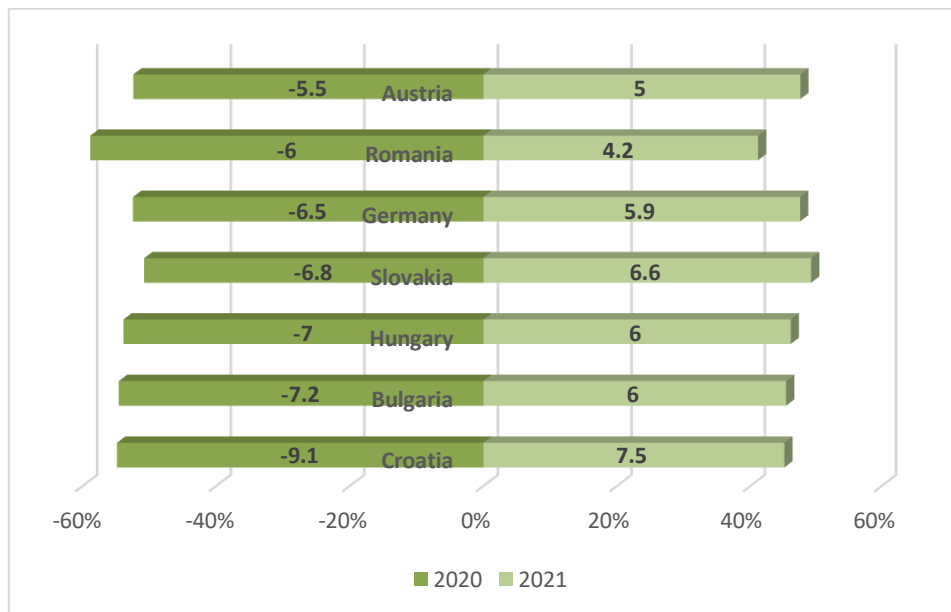

Figure 2. Real GDP Growth Rate Forecast in EU Danube States (%)

The present research deals to the idea that the economic recession in the EU Danube States would lead to a common position in passing recession and why not a common economic strategy able to valorise the advantages which come from their status as Danube states.

In order to support the above approach, the present paper proposes a model of maximization the national economic output in order to obtain maximum of economic efficiency under the pandemic's impact.

The objective of the research are:

O1: Identifying the elements which are essential in improving the national economic recovery capacity during the present crisis.

O2: Quantifying each element of influence and building an adequate database.

O3: Realising a hierarchy of the most important regional actors according to their economic recovery capacity.

2. Literature Review

Evan that the present pandemic crises is acting now, there are a lot of scientific researches which are trying to explain and to quantify the pandemic's impact on the economic development. Some of the most representative such papers are presented in Table 1.

Table 1. Literature Review.

No	Authors	Model's characteristics	Author's criticism
1.	Haleem, A., Javaid, M., Vaishya, R. and. Deshmukh, S.G., 2020.	The authors point out the idea of interdisciplinary researches in order to fight against the Coronavirus (COVID-19). The number of infectionsand proportionate fatalities are being reported both from developed and under developed countries. As aresult, there is an urgent requirement for conducting academic research on several aspects of this highly contagious disease, to find effective means of containment and treatment of the disease, for now, and in future.	The approach that COVID-19 pandemic is a public health emergency of international concern is a correct one. The solution of this challenge has to be multi-disciplinary and trans-national. Unfortunately, the authors limited their approach to the research in the biological and the medical sciences and didn't take into account the economic solutions in

No	Authors	Model's characteristics	Author's criticism
		The authors identified some opportunities for academic research related to COVID-19 and have also provided suggestions to contain, prevent and treat this viral infection.	fighting against this pandemic.
2.	Peterson, K. O. & Thankom, G.A., 2020	The authors analyse the connection between the health crisis and the economic crisis. They concluded that the virus encouraged social distancing which led to the shutdown of financial markets, corporate offices, businesses and events. On the other hand, the same virus led to flight to safety in consumption and investment among consumers, investors and international trade partners. The main conclusion of this research is that the increasing number of confirmed coronavirus cases did not have a significant effect on the level of economic activities as the economic, social and medical policies did have.	The first limitation of this research is the short analysed period. Moreover, the study was not able to cover different aspects of the pandemic's impact on socio-economic environment. This is why the authors mentioned that they will continue this analysis which will be focused on the banks and financial institutions' reaction to the economic policy developments during the coronavirus crisis.
3.	Goodell, J.W., 2020	The paper analyses the high impact of the COVID-19 pandemic on the economic and the social elements of the human society. Moreover, it realises a comparision between this pandemic and other epidemics and pandemics. Using the literature review, the author points out the possible directly or indirectly impacts of COVID-19 on the financial markets and the institutions.	The conclusion of the paper that the COVID-19 pandemic is causing a direct global destructive economic impact is too hard. The costs of this pandemic are very difficult to quantify now. This is why the author considers that the answers will be found by academics for many years to come.
4.	Malis-zewska, M., Mattoo, A. and van der Mensbrugg he, D., 2020	The authors analysed the potential impact of COVID-19 on GDP and trade, using a standard global computable general equilibrium model. The results of the model implementation consist of: the underutilization of the labor and the capital, the increase in	Even the analysis in this paper is complex, the authors didn't take into consideration the financial shocks and the decrease in demand and FDI.

No	Authors	Model's characteristics	Author's criticism
		international trade costs, a decrease in the travel services, and a redirection of the demand away from activities that require proximity between people.	
5.	Bennedsen, M., Larsen, B., Schmutte, I. and Scur, D., 2020	The authors used a survey of 10642 small, medium and large companies from Denmark. The data from this survey were analysed in order to quantify the impact of the COVID-19 pandemic on the government policies for supporting these companies. A dedicated model was built in order to quantify the effects of the public aids to each category of companies.	The authors pointed out the relationship between taking up labour aid and reporting lower layos and more furloughs, while the relationship for firms taking up cost aid is mixed. But the same authors were not able to find a connection between the fiscal aids and the firms' evolution.

The above short literature review supports the need of a new model able to quantify and to improve the EU Danube States' economic recovery capacity.

3. Methods and Methodology

The present analysis takes into consideration six important indicators which have maximum impact in the national defence capacity against the complex crisis in 2020 and afterwards: GDP (PPP)/capita, net export, hospital beds/1000 inhabitants, employment, and general government gross debt. The whole approach is based on the following *hypotheses:*

H1: Some from above indicators (GDP (PPP)/capita, net export, hospital beds/1000 inhabitants and employment have to be as large as possible.

H2: The general government gross debt has to be positive as less as possible, because it quantifies the dependence of the economic entities by the loans.

H3: In order to simplify the analysis, it is assumed that all above five indicators have the same contribution to the national/regional recovery capacity against the present complex crisis.

According to the above presentation, the propose model is basically a maximization function as:

$$Y = [max] \sum_{i=1}^{7}(gdp_i * a_i + nexp_i * b_i + hb_i * c_i + L_i * d_i) - [min] \sum_{i=1}^{7} ggd_i * e_i + \varepsilon \quad (1)$$

If: $cab_i > 0$ (2)

and $\varepsilon \neq 0$.   (3)

In the above equation: gdp - GDP/capita; nexp – net export; hb - Hospital beds/1000 inhabitants; L - employment; ggd - general government gross debt; i – all seven EU Danube States; ε - correction element; a, b, c, d, e, f - coefficients that express the weight of each indicator in achieving the ability to to achieve the economic recovery. According to H3:

a = b = c =d = e   (4)

In order to start the analysis, a dedicated database was built using the latest official statistical data (European Commission, 2020). The data used by this analysis cover 2011-2020 (see Appendix). The database covers 10 years and is representative for a correct analysis. The statistical official data were completed with ARIMA forecasting procedure, using IBM-SPSS25 software.

According to the data from the Appendix, the socio-economic and medical performances in 2020 are worst compared to the previous year. The implementation of the model for 2020 leads to the following results:

Y = (51109 + 26088 + 51410 + 34771 + 31070 + 22807 + 24870)*0.2+ (14.6 - 6.0 + 232.1+ 1.8 + 5.7 + 1.4-0.4)*0.2+ (722.7+719.2+781.3+562.9+691.0+801.3+530.1)*0.2+ (4090+8324+40387+2579+4592+3114+1620)*0.2 - (300.1+76.7+2346.7+49.6+90.7+12.7+43.0)*0.2= 48425+ 49.84+ 961.7+ 12941.2-583.9= 61793.84

The value of the total impact of the Covid - 19 pandemic on the Danube EU Members State has to be compared to forecasted one for 2021. In order to do this, a forecasting procedure under IBM-SPSS 25, which uses ARIMA conditions, will be applied.

4. Results and Discussion

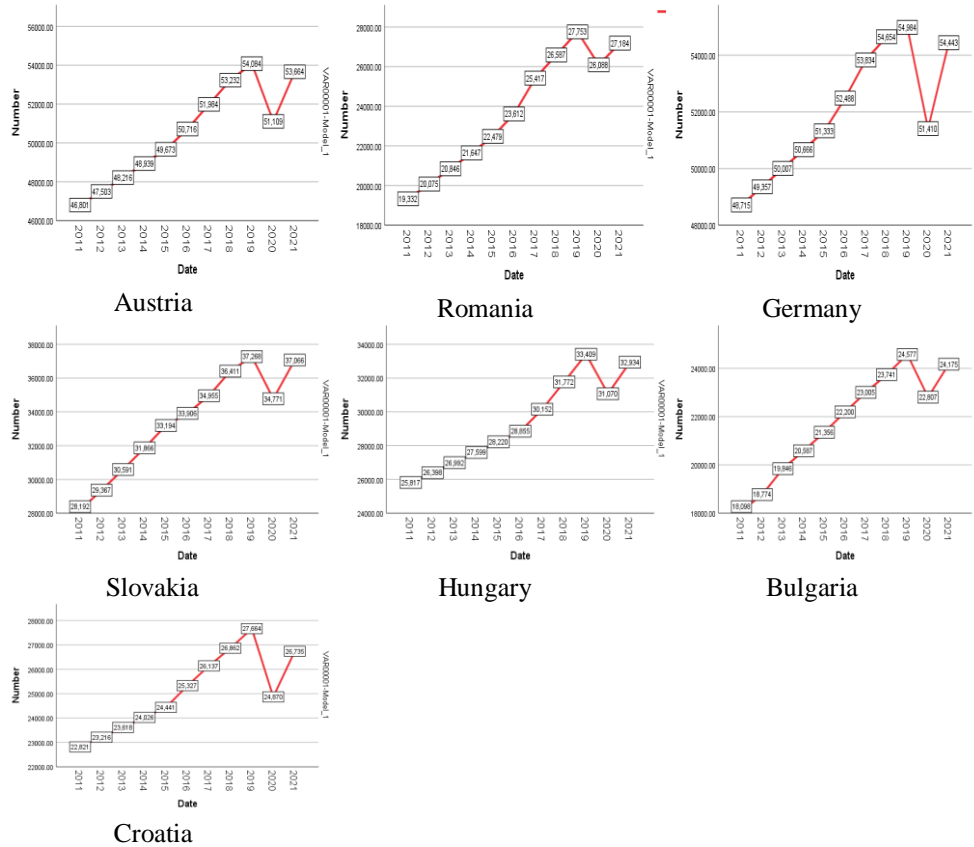The forecasted data for GDP/capita in 2021 are presented in Figure 3.

Figure 3. The Forecasted data for GDP/Capita in 2021 (USD)

According to Table 2, all Danube EU Member States will face to a drop in their economic development in 2020. It will be followed by a relative economic recovery in 2021. Unfortunately, this last recovery will be not enough to cover the drop in 2020. The most official optimistic approaches talk about a complete recover only in 2020, if the pandemic will not develop under a new wave.

The second forecasted indicator is Net export of goods. It represents the difference between the value of the exported goods and the value of the imported goods in a year (see Figure 4).
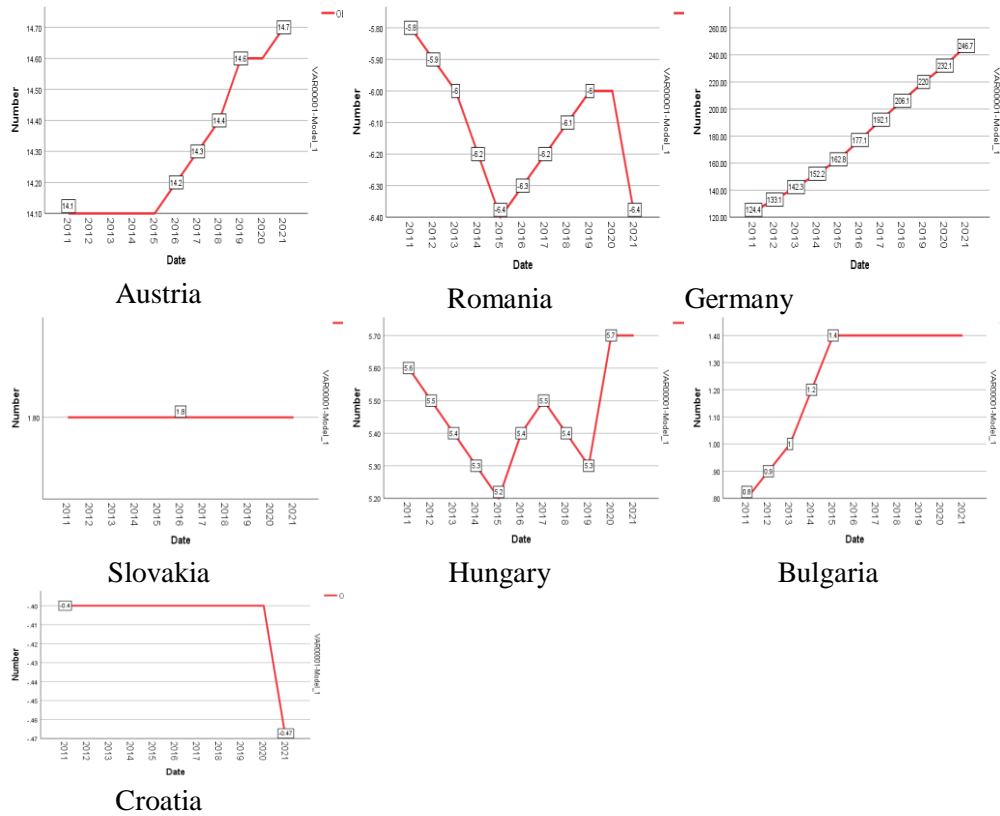
Figure 4. The Forecasted Data for Net Export of Goods in 2021 (bn. Euros).

Some analysed countries (like Austria and Germany) continued to obtain advantage from the international trade of goods. These advantage can be used in order to improve their fight against pandemic and economic recession. Slovakia, Bulgaria and Hungary will maintain their terms of their trade balances for goods, while Romania and Croatia will face to a worse situation in 2021.

An important element in fighting against the present pandemic is the number of the hospital beds. As general trend, this number decreased during the analysed period. The evolution of this indicator in 2021 is presented in Figure 5.

Austria

Romania

Germany

Slovakia

Hungary

Bulgaria

Croatia
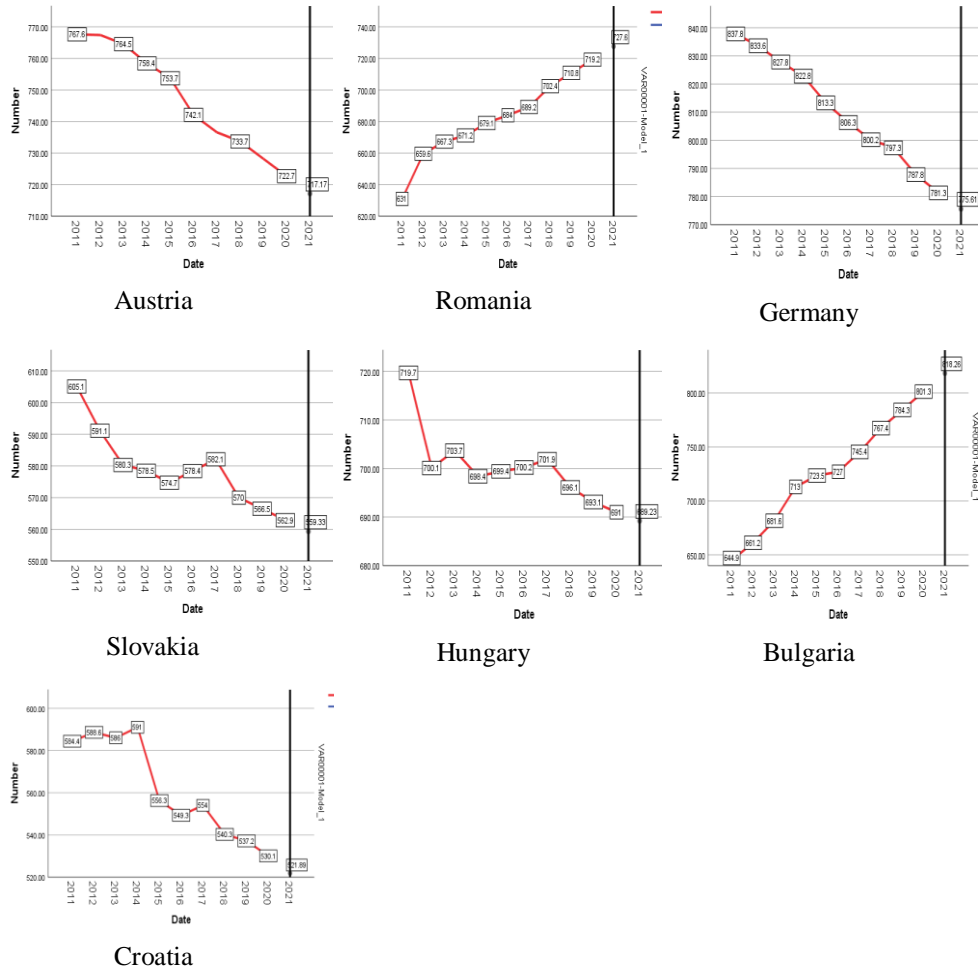
Figure 5. The Forecasted Data for Hospital Beds/1000 Inhabitants in 2021.

According to Figure 5, only two Danube countries will succeed in increasing their number of the hospital beds/100000 inhabitants. This means that the other five states will be not able to face to a new wave of Covid-19 pandemic.

The employment represents an important element in supporting the economic recovery. The trend of this indicator in the Danube EU Member States is presented in Figure 6.

Austria

Romania

Germany

Slovakia

Hungary

Bulgaria

Croatia
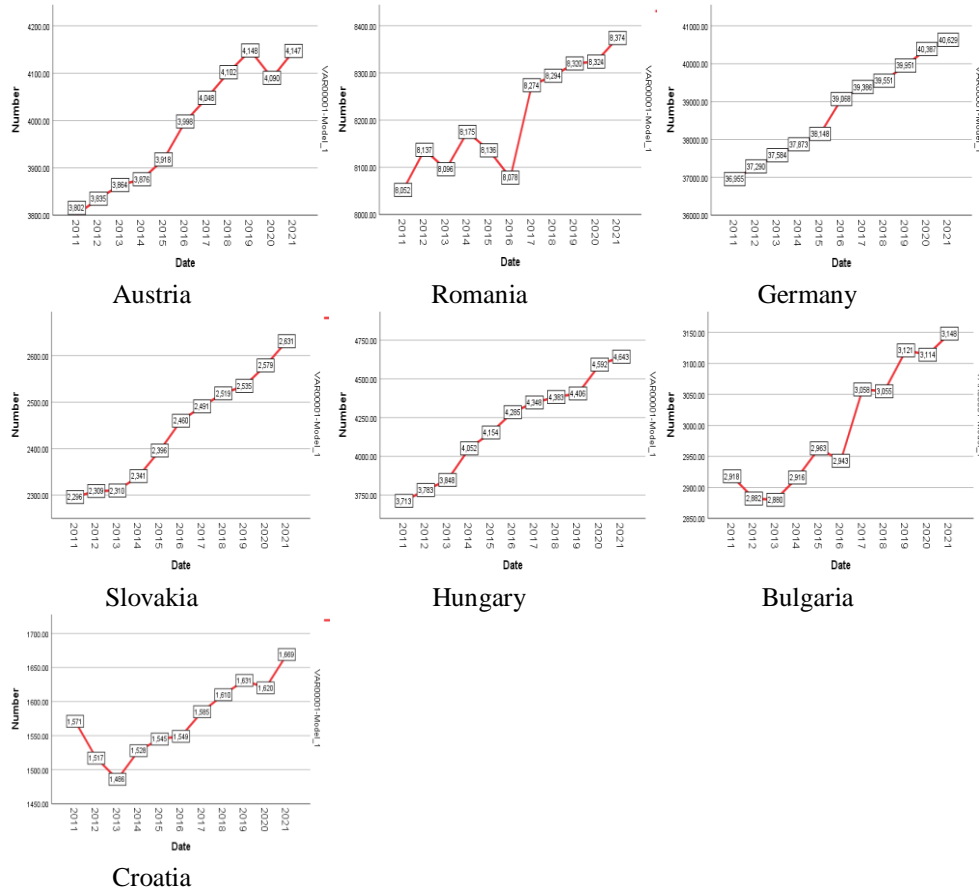
Figure 6. The Forecasted data for Employment in 2021 (Thousands Persons)

It is no doubt that all Danube EU Members States will force the employment increase in 2021 compared to the previous year, in order to produce more and to increase all the revenues.

Finally, the general government gross debt potentiates the economy's capacity to fight against the Covid-19 impact and economic recession, as well. The statistical data regarding this indicator in 2021 are presented in Figure 7.

Austria

Romania

Germany

Slovakia

Hungary

Bulgaria

Croatia
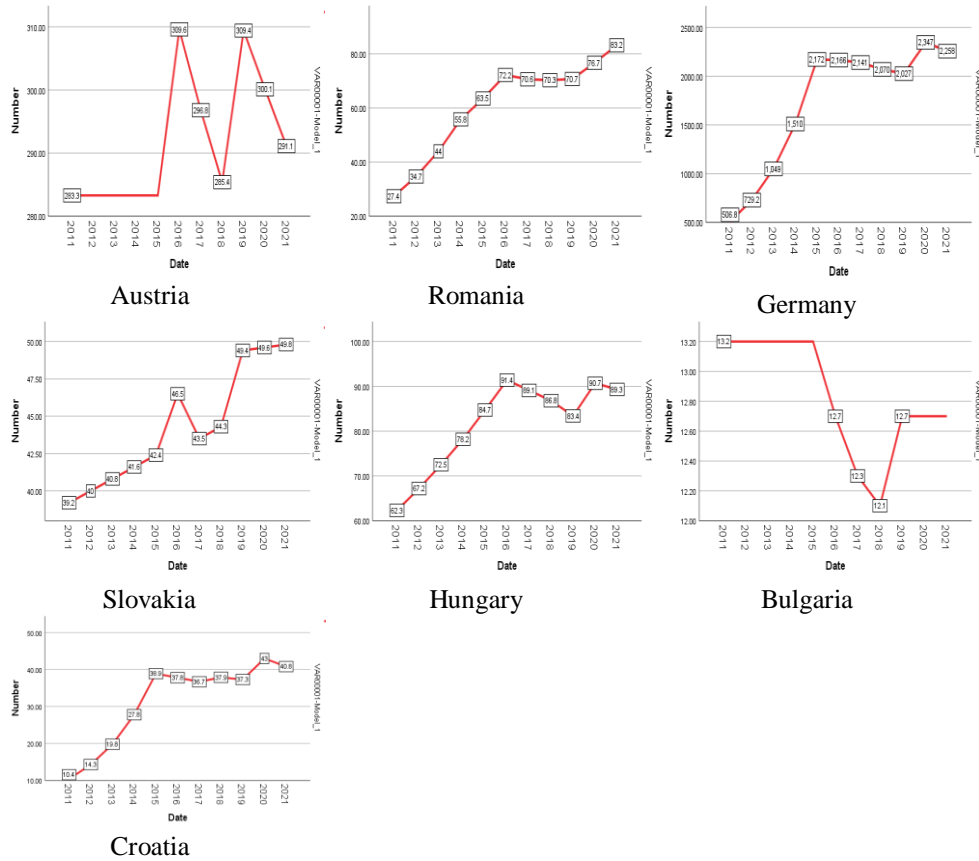
Figure 7. The Forecasted Data for the General Government Gross Debt in 2021 (bn. Euros).

As a general point of view, the states which will be able to decrease their gross debt will obtain more instruments in fighting against Covid-19 pandemic and recession.

According to the data quantified for 2021, the implementation of the proposed model lead to the following values:

Y = (53664 + 27184 + 54443 + 37066 + 32934 + 24175 + 26735) * 0.2+ (14.7 - 6.4 + 246.7+ 1.8 + 5.7 + 1.4 - 0.5) * 0.2+ (717.2+727.6+775.6+559.3+689.2+818.3+521.9) * 0.2+ (4147+8374+40629+2631+4643+3148+1669) * 0.2 - (291.1+83.2+2257.5+49.8+89.3+12.7+40.8) * 0.2= 51240.2 + 52.68 + 961.82 + 13048.2 – 564.88 = 64738.02

5. Conclusions

The above analysis leads to a single conclusion: the impact of the pandemic is a very important one and the economic restart will be more than difficult. The economic development in the EU Danube Member States will lead to great disparities. This disparities will be not eliminated in 2021 if the present trend will continue. In order to decrease the socio-economic disparities, to improve the labour market mechanisms and to ensure a better health care protection in this region, the solution would be a common strategy under the future German EU presidency. Unfortunately, the official statements of the German government pointed out the idea of a policy focused on the international relationship with China not to a consolidation of the economic region.

The theoretical model proposed in this paper was practically tested by case analysis on all EU Danube Member States, highlighting the validity of the model through statistical tests run through IBM-SPSS 25 software. In addition, the model is obviously useful for the regional / local decision-makers in order to mitigate the described above phenomena. From a theoretical point of view, the model is a useful exercise in universities and not only, but especially for entrepreneurs focused on developing their business across the Danube region. From the research point of view, the model is interesting because it brings a new approach in the field and offers possibilities for further extension of the analysis by increasing the number of variables taken into account.

The limitations of the study are related to the limited nature of the used data and the introduced variables during the conceptualization of the model. These can be further extended to adapt the model to the current crisis situation.

For our point of view, we will continue the research in order to apply this model to the same Danube region in the context of the new developments related to a new Covid-19 wave. As a result, the coefficients which express the weight of each indicator in achieving the ability to achieve the economic recovery and to fight against the pandemic (a, b, c, d, e) have to be changed.

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Appendix

Table 2. Statistical Database

State	Indicator	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Austria	GDP/capita (PPP) USD	46801	47503	48216	48939	49673	50716	51984	53232	54084	51109
	Net export of goods (bn. Euros)	14.1	14.1	14.1	14.1	14.1	14.2	14.3	14.4	14.6	14.6
	Hospital beds/1000 inhabitants	767.6	767.4	764.5	758.4	753.7	742.1	736.6	733.7	728.2	722.7
	Employment (thousands persons)	3802	3835	3864	3876	3918	3998	4048	4102	4148	4090
	General government gross debt (bn. Euros)	283.3	283.3	283.3	283.3	283.3	309.6	296.8	285.4	309.4	300.1
Romania	GDP/capita (PPP) USD	19332	20075	20846	21647	22479	23612	25417	26587	27753	26088
	Net export of goods (bn. Euros)	-5.8	-5.9	-6.0	-6.2	-6.4	-6.3	-6,2	-6.1	-6.0	-6.0
	Hospital beds/1000 inhabitants	631.0	659.6	667.3	671.2	679.1	684.0	689.2	702.4	710.8	719.2
	Employment	8052	8137	8096	8175	8136	8078	8274	8294	8320	8324

	(thousands persons)									
	General government gross debt (bn. Euros)	27.4	34.7	44.0	55.8	63.5	72.2	70.6	70.3	70.7	76.7
Germany	GDP/capita (PPP) USD	48715	49357	50007	50666	51333	52488	53834	54654	54984	51410
	Net export of goods (bn. Euros)	124.4	133.1	142.3	152.2	162.8	177.1	192.1	206.1	220.0	232.1
	Hospital beds/1000 inhabitants	837.8	833.6	827.8	822.8	813.3	806.3	800.2	797.3	787.8	781.3
	Employment (thousands persons)	36955	37290	37584	37873	38148	39068	39386	39551	39951	40387
	General government gross debt (bn. Euros)	506.8	729.2	1049.2	1509.6	2172.1	2165.6	2140.6	2070.2	2026.5	2346.7
Slovakia	GDP/capita (PPP) USD	28192	29367	30591	31886	33194	33906	34955	36411	37268	34771
	Net export of goods (bn. Euros)	1.8	1.8	1.8.	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	Hospital beds/1000 inhabitants	605.1	591.1	580.3	578.5	574.7	578.4	582.1	570.0	566.5	562.9

	Employment (thousands persons)	2296	2309	2310	2341	2396	2460	2491	2519	2535	2579
	General government gross debt (bn. Euros)	39.2	40.0	40.8	41.6	42.4	46.5	43.5	44.3	49.4	49.6
Hungary	GDP/capita (PPP) USD	25817	26398	26992	27599	28220	28855	30152	31772	33409	31070
	Net export of goods (bn. Euros)	5.6	5.5	5.4	5.3	5.2	5.4	5.5	5.4	5.3	5.7
	Hospital beds/1000 inhabitants	719.7	700.1	703.7	698.4	699.4	700.2	701.9	696.1	693.1	691.0
	Employment (thousands persons)	3713	3783	3848	4052	4154	4285	4348	4383	4406	4592
	General government gross debt (bn. Euros)	62.3	67.2	72.5	78.2	84.7	91.4	89.1	86.8	83.4	90.7
Bulgaria	GDP/capita (PPP) USD	18098	18874	19846	20587	21356	22200	23005	23741	24577	22807
	Net export of goods (bn. Euros)	0.8	0.9	1.0	1.2	1.4	1.4	1.4	1.4	1.4	1.4
	Hospital beds/1000	644.9	661.2	681.6	713.0	723.5	727.0	745.4	767.4	784.3	801.3

	inhabitants										
	Employment (thousands persons)	2918	2882	2880	2916	2963	2943	3058	3055	3121	3114
	General government gross debt (bn. Euros)	13.2	13.2	13.2	13.2	13.2	12.7	12.3	12.1	12.7	12.7
Croatia	GDP/capita (PPP) USD	22821	23216	23618	24026	24441	25327	26137	26862	27664	24870
	Net export of goods (bn. Euros)	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
	Hospital beds/1000 inhabitants	584.4	588.6	586.0	591.0	556.3	549.3	554.0	540.3	537.2	530.1
	Employment (thousands persons)	1571	1517	1486	1528	1545	1549	1585	1610	1631	1620
	General government gross debt (bn. Euros)	10.4	14.3	19.8	27.8	38.9	37.8	36.7	37.9	37.3	43.0