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# DETERMINANTS OF VOLATILITY OF ECONOMIC ACTIVITY IN EUROPE DURING THE COVID-19 PANDEMIC: STYLIZED FACTS

Determinante volatilnosti privredne aktivnosti u Evropi tokom pandemije kovida 19 – stilizovane činjenice

## Abstract

In 2020, due to the COVID-19 pandemic, almost all European countries recorded negative rates of economic growth, with relatively large variations from one country to another in terms of the depth of the recession. From the expenditure side, the decline was most pronounced in the segment of personal consumption and investment. Observed by sectors, the largest decline was recorded in transport and tourism, manufacturing industry and construction. This paper analyzes three groups of factors that could have potentially influenced the variation in the depth of the recession in European countries in 2020 – the application of non-pharmacological epidemiological measures, the structure of the economy and the fiscal policy response. The data reveal a relatively strong negative correlation between the GDP growth rate and the share of the tourism sector, as well as a moderate negative correlation between the growth rate and the stringency of epidemiological measures and a moderate positive correlation between the size of direct fiscal stimuli and economic growth. The decline in Serbia's GDP in 2020 was significantly lower than the average decline in EU countries. During most of 2020, Serbia applied looser epidemiological measures, while the share of the tourism sector in Serbia's GDP is significantly smaller, and the contraction in this sector was lower than the European average. Direct fiscal stimuli in Serbia were significantly higher (by 48 percent) than the European average. This may indicate that these three groups of factors could potentially explain the lower decline of the Serbian economy compared to the European average in 2020. To draw final conclusions on this issue, econometric modeling would be required, taking into account the influence of other factors, as well.

**Keywords:** COVID-19 pandemic, economic growth, non-pharmacological epidemiological measures, sectoral structure of economy, fiscal policy.

## Sažetak

Gotovo sve evropske države su u 2020. godini, usled pandemije kovida 19 zabeležile negativne stope privrednog rasta, uz relativno veliku varijaciju po državama u pogledu dubine recesije. Sa rashodne strane posmatrano, pad je bio najizraženiji u segmentu lične potrošnje i investicija, a posmatrano po sektorima, najveći pad zabeležen je u sektoru saobraćaja i turizma, industrije i građevinarstva. U ovom radu se analiziraju tri grupe faktora koje su potencijalno mogle da utiču na varijaciju u dubini recesije u evropskim državama u 2020. godini – primena nefarmakoloških epidemioloških mera, struktura privrede i odgovor fiskalne politike. Podaci ukazuju na postojanje relativno snažne negativne korelacije između stope rasta BDP-a i udela sektora turizma, kao i umerene negativne korelacije između stope rasta i striktnosti epidemioloških mera, te umerene pozitivne korelacije između veličine direktnih fiskalnih stimulansa i stope privrednog rasta. Pad BDP-a Srbije u 2020. godini bio je znatno blaži u odnosu na prosečan pad u zemljama EU. Srbija je tokom većeg dela 2020. godine primenjivala blaže epidemiološke mere, dok je udeo sektora turizma u BDP-u Srbije znatno manji, a pad u ovom sektoru blaži u odnosu na evropski prosek. Istovremeno, direktni fiskalni stimulansi u Srbiji su bili znatno veći od evropskog proseka, što može ukazivati na to da ove tri grupe faktora mogu potencijalno objašnjavati blaži pad privrede Srbije u odnosu na evropski prosek u 2020. godini. Za izvođenje konačnih zaključaka po ovom pitanju, neophodno bi bilo izvršiti ekonometrijsko modeliranje, uzimanjem u obzir i uticaja drugih faktora.

**Cljučne reči:** pandemija kovida 19, privredni rast, nefarmakološke epidemiološke mere, sektorska struktura privrede, fiskalna politika.

## Introduction

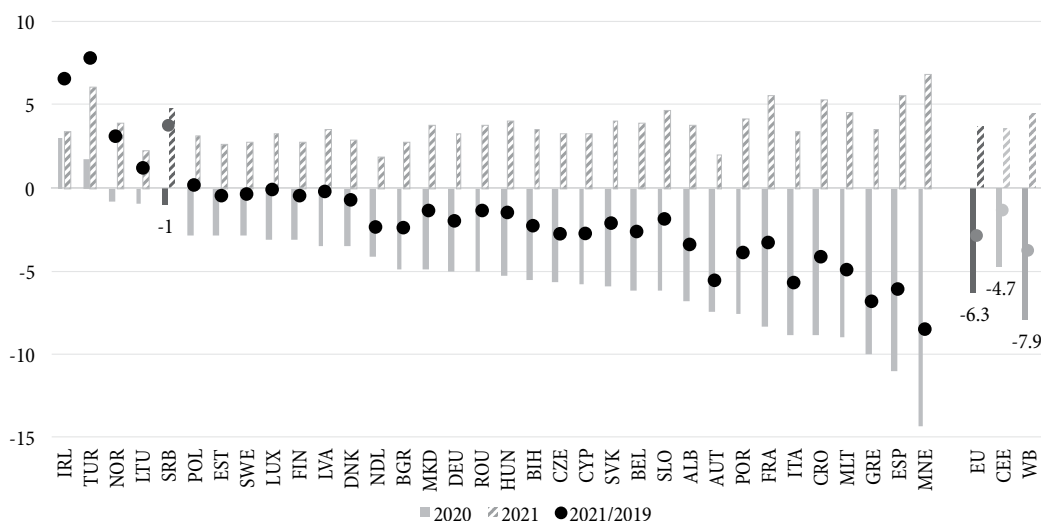
Outbreak of the COVID-19 pandemic at the beginning of 2020 has had an adverse effect on economic activity throughout Europe (and the world) via various channels, both on the supply and the demand side [12]. On the supply side, the COVID-19 pandemic has disrupted global supply chains, with lockdown measures triggering disruption of regular business operations. On the demand side, the rising unemployment and high uncertainty regarding the depth and duration of the pandemic crisis has also had a negative impact on consumption and investment decisions of companies and households. In response to these shocks, European governments have implemented massive fiscal and monetary stimuli aimed to bridge the liquidity gaps and combat recessionary trends. After a very steep decline in the second quarter, gradual lifting of containment measures and adaptation of businesses and households to the pandemic environment led to the recovery of economic activity in the third quarter of 2020. However, deterioration of epidemiological situation in the last quarter has decelerated the recovery trends, which is why the real economic activity at the end of 2020 still fell short of the precrisis level in most of the European countries. According to the Eurostat data, economic activity (GDP) in the EU-27 dropped by 6.3 percent in real terms in 2020. Although recession in 2020 was less deep than it had been forecasted at the beginning of the pandemic (initial forecasts saw EU-27 to decline by 7.4 percent), it is

still an unprecedented downturn in the post-World War II era. Data on GDP growth in 2020 (Figure 1) signal high variation across Europe – from real growth of 3 percent (in Ireland) to -14.3 percent (in Montenegro). On average, Central and Eastern European (CEE) countries<sup>1</sup> faced a somewhat milder recession than the other EU Member States, while the recession in the Western Balkan countries<sup>2</sup> was more severe.

Adaptation to the new *modus operandi*, extension of government support programs and launch of massive vaccination rollouts shape more positive forecasts on economic activity in 2021. According to the latest forecasts of the European Commission [4], [5], EU economies are expected to reach a real (average) GDP growth of 3.7 percent in 2021, with the growth rates ranging from 2 percent in Austria to 6.3 percent in Montenegro. Despite that, in all but six European countries (Ireland, Turkey, Norway, Lithuania, Poland and Serbia), the real GDP in 2021 is expected to be lower than in 2019. On average, real GDP of EU-27 countries in 2021 is expected to fall short by 2.8 percent in comparison with 2019, while the gap in the Western Balkan countries is projected at 3.8 percent.

- 1 For the purposes of this paper, the CEE region includes the following countries: Bulgaria, Czechia, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.
- 2 For the purposes of this paper, the Western Balkans include the following countries: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia. However, when calculating Western Balkans average indicators, we exclude Serbia in order to provide appropriate benchmark for the data for Serbia.

Figure 1: GDP growth rates in Europe, 2020-2021 (in %)



Source: Author's calculations based on the Eurostat data.

Due to similar reasons and in a rather similar way, the COVID-19 pandemic has also affected the Serbian economy. After a deep recession in the second quarter, the Serbian economy started recovering in the mid-2020. According to the latest projections [5], GDP of Serbia decreased in real terms by 1 percent in 2020, which places Serbia among the first five countries (ranking behind Ireland, Turkey, Norway and Lithuania) in terms of economic growth outcome in the respective year. Furthermore, according to the latest forecasts of the International Monetary Fund and the European Commission, the economy of Serbia in 2021 is expected to achieve real growth of 4.8-5 percent. In that case, the real output of the Serbian economy would be higher by 3.8 percent than it was in 2019.

Data presented in Figure 1 show a high variation of output trends in the first year of the pandemic, which raises the question of drivers of economic outcomes during the pandemic. To be able to provide robust and methodologically well-grounded answers to this question, a comprehensive econometric analysis which includes a wide set of economic and non-economic parameters would be required, which is beyond the scope of this paper. Instead, this paper is aimed to provide key stylized facts on the three particular sets of drivers of economic outcomes during the pandemic which are often argued as relevant in shaping economic outcomes during the COVID-19 pandemic [11] – stringency of containment measures, sectoral structure of the economy and the size of fiscal stimulus programs.

In that respect, the rest of the paper is structured as follows. The second section provides disaggregation and mapping of economic activity outcomes in 2020 both from the expenditure and the production side. The third section discusses three sets of drivers of economic outcomes, while the fourth section provides concluding remarks, with the discussion and policy recommendations.

### Disaggregation of economic growth performances in 2020

Output can be disaggregated and observed from the expenditure and income side, as well as from the sectoral perspective. From the expenditure side, GDP consists of

personal consumption (C), government consumption (G), investment in fixed capital (I), exports (X) and imports (M). In all European countries, including Serbia, all expenditure components of GDP, except government consumption, underwent a considerable decline in 2020. The EU-27 data suggest that the largest negative contribution to the recession in 2020 came from the decline in personal consumption and investment, which is explained by the implementation of lockdown policies and high level of uncertainty that motivates people and companies to postpone their investment and consumption. On the other hand, impact of net exports on European economies was close to neutral (both exports and imports underwent a similar relative decrease), while the rise in government spending in response to the COVID-19 crisis had a positive impact on overall economic activity (Figure 2).

Similar trends in expenditure components of GDP have been observed in Serbia in the first year of the pandemic. The data presented in Figure 2 show that personal consumption, investment and net exports recorded a considerable annual decline, while government consumption expanded sharply in order to offset a part of the negative trends in other components of GDP. In comparison with the EU-27 average and the CEE average, consumption and investment in Serbia underwent a slighter decline. On the other hand, net exports from Serbia have had a greater negative impact on output than it was on average the case in the EU-27, while increase in government spending in Serbia significantly outweighed the trends in the EU and CEE countries, due to high growth of public wages (legislated before the pandemic) and high spending on goods and services during the pandemic.

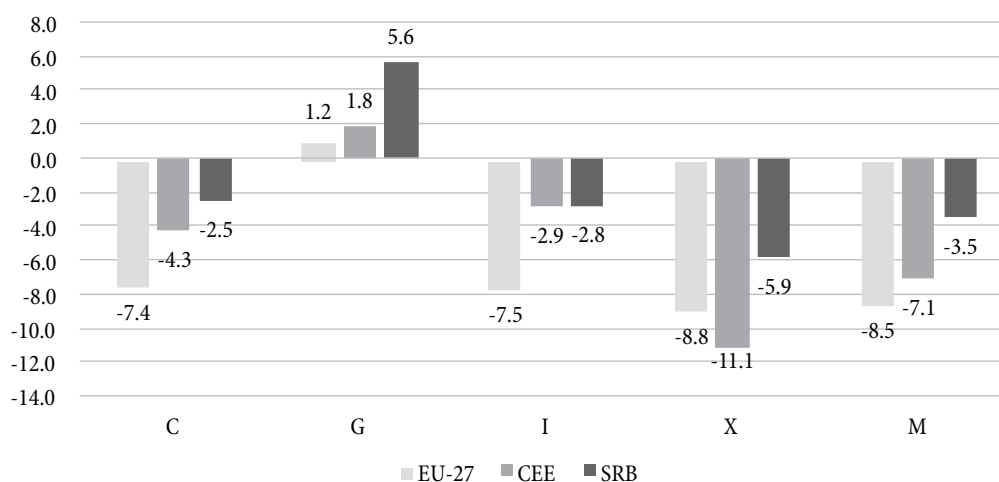
Impact of the pandemic also differs significantly across the sectors, which is why it is relevant to evaluate the trends in economic activity per main sectors, using the gross value added (GVA) data. According to the Eurostat data (Figure 3), all sectors in the EU, except information and telecommunication (ICT), reported negative growth rates of GVA in 2020, transportation and tourism being the most heavily affected. Thus, in the EU-27, GVA of trade, transportation and tourism dropped by 12.4 percent in 2020, with actual decline in transportation and tourism being even more pronounced, as the trade has not been

that severely affected. Significant decline was also observed in the manufacturing and construction sectors.

Data for Serbia show that negative growth of GVA has been observed in trade, transportation and tourism, as well as in construction and other sectors, while ICT, finance and insurance and agriculture recorded a significant rise in their GVA. At the same time, GVA in manufacturing stagnated. Decline of activity in tourism and transportation in Serbia was less pronounced than in many other European countries, due to the lower share of international travelers in the total GVA of the respective sector. Deterioration in construction is a consequence of the pandemic and a strong basis of comparison, since the official data of the Statistical Office of Serbia have reported

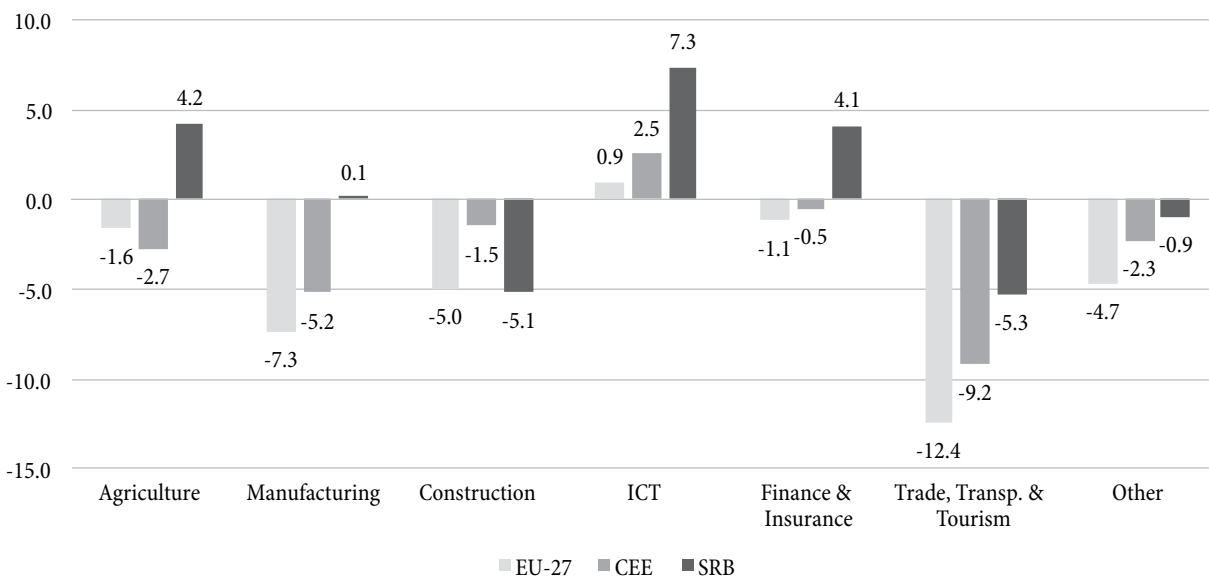
a very high growth in the construction industry at the end of 2019, which was explained by the development of the “Turkish Stream” pipeline system. Growth in ICT services observed in 2020 is a continuation of positive trends of the emerging IT sector in Serbia, prevalent for several consecutive years, now being further fostered by the switch of many activities to online platforms. Growth of GVA in agriculture, on the other hand, is mostly a result of favorable weather conditions in 2020. Better performance in terms of GVA trends in manufacturing in Serbia, in comparison with the other European countries, may be the result of a larger share of food processing and utilities and a smaller share of car industry in the total manufacturing output.

Figure 2: GDP growth rate in 2020, expenditure side (in %)



Source: Author's calculations based on the Eurostat data.

Figure 3: Gross value added, growth rate in 2020 per main sectors (in %)



Source: Author's calculations based on the Eurostat data.

## Determinants of economic outcomes in the first year of the pandemic

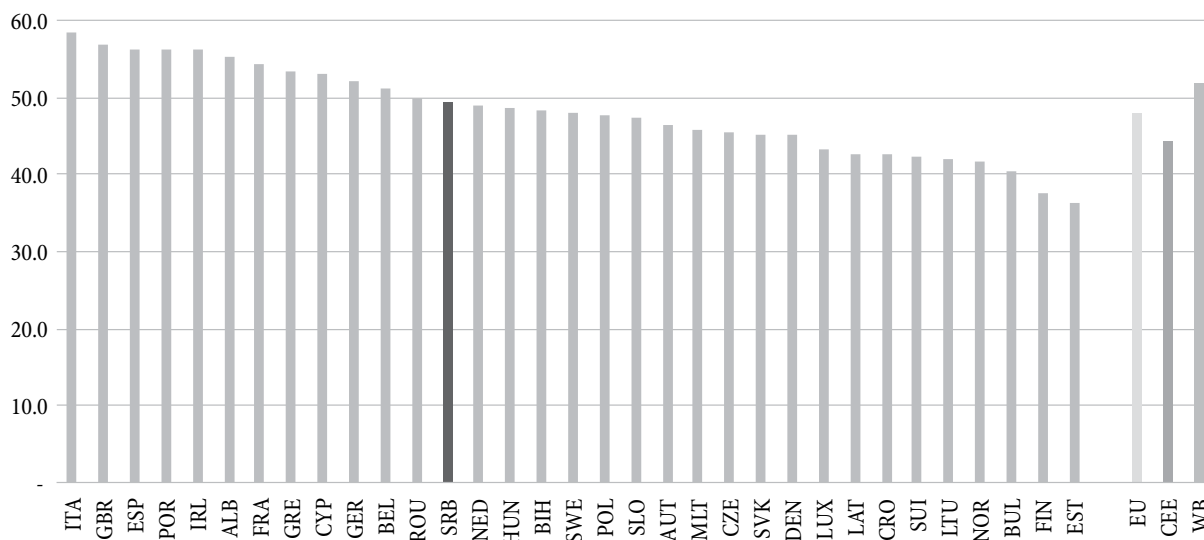
### Stringency of containment policy

In response to the surging number of COVID-19 cases that may pose a threat to the public health system, most of the European countries have been implementing some form of non-pharmaceutical epidemiological measures from March 2020, aimed to reduce mobility and social contacts of individuals. The World Economic Outlook (2020) report suggests that containment policies significantly shape economic outcomes, including GDP growth, consumption and investment trends, retail sale, manufacturing, services dynamics and unemployment. Containment policies may have had an adverse impact on economic activity both from the supply side, as they may harm performances of supply chains, as well as from the demand side, since lower mobility and social interactions lead to deterioration in consumption. While the negative supply shock may have stagflationary effects, a drop in demand exhibits deflationary pressure. Thus, Baqaee and Farhi [1] employ the Keynesian model by using the US data and conclude that negative supply and demand shocks, triggered by lockdown, account for one half of the reduction in real GDP in the US in the February-May 2020 period. Similarly, Deb, Furceri, Ostry and Tawk [3] use daily global data on real-time containment

measures and a set of indicators of economic activity (e.g., nitrogen dioxide emissions, number of flights, energy consumption, maritime trade and mobility indices) to conclude that containment measures have had, on average, a very large impact on economic activity – equivalent to a loss of about 15 percent in industrial production over a 30-day period following their implementation. On the other hand, König and Winkler [9] use the data on the first three quarters of 2020 for 42 countries and conclude that lockdown stringency is a more important driver of economic growth than the fatality rate is. They also show that more restrictive containment measures are associated with a greater drop in real GDP, but also being associated with positive effects, in terms of stronger recovery in the following quarter.

Measuring the impact of containment policy is associated with methodological challenges, as it is difficult to differentiate the impact of enforced mobility limitations imposed through lockdown from the voluntary compliance with the requirements to reduce social mobility and contacts during the pandemic (see [7]). Empirical studies on evaluating the impact of COVID-19 containment policies often rely on the COVID-19 Government Response Stringency Index, created by the University of Oxford. Stringency Index is a composite measure, i.e., a simple average of nine subindicators derived from an ordinal scale (school closures, workplace closures, cancellations of public events, gathering restrictions, public transportation

Figure 4: COVID-19 Government Response Stringency Index (2020 average)



Source: Author's calculations based on the data sourced from Our World in Data database.

closures, stay-at-home requirements, restrictions on internal movement, controls on international traveling and public information campaigns), which can take value from 0 to 100, the higher value of the index indicating more stringent regulations.

Data presented in Figure 4 show the average value of the Stringency Index during 2020 in Europe and indicate a considerable variation of stringency of containment policies in Europe (from 36.4 in Estonia to 59.5 in Italy). On average, stringency of containment policy in EU-27 was higher than in the CEE region, but lower than in the Western Balkans.

The data on GDP growth and Stringency Index in 2020 show that there was a rather strong negative relationship between stringency of containment measures and the GDP growth in 2020 (Figure 5), which is in line with the general findings of other studies based on partial datasets for 2020 (e.g., [3] and [9]).

Serbia ranks 13th (among 33 European countries) in terms of average stringency of containment policy in 2020, which is why it is expected that, over the whole year, containment policy may have had a more negative impact on economic outcomes in Serbia than in the EU and the CEE, but less negative than in the other Western Balkan countries. However, the impact of lockdown on economic activity depends not only on their stringency, but also on the duration of strict measures. Data presented in Table 1 suggest that over the 53 days (mid-March to early May

2020) Serbia implemented a much stricter containment policy, while over the remaining 239 days of 2020, the containment policy in Serbia was on average looser than in the EU and the CEE. Therefore, the fact that for the most part of the year Serbia implemented a looser containment policy may have contributed positively to output dynamics, relative to other countries.

**Table 1: Average value of the Stringency Index per subperiods**

Period	15.03-06.05.2020	07.05.-31.12.2020
Number of days	53	239
	Mean	Mean
EU	76.9	54.1
CEE	76.1	49.1
WB <sup>3</sup>	87.0	57.7
SRB	95.4	52.8

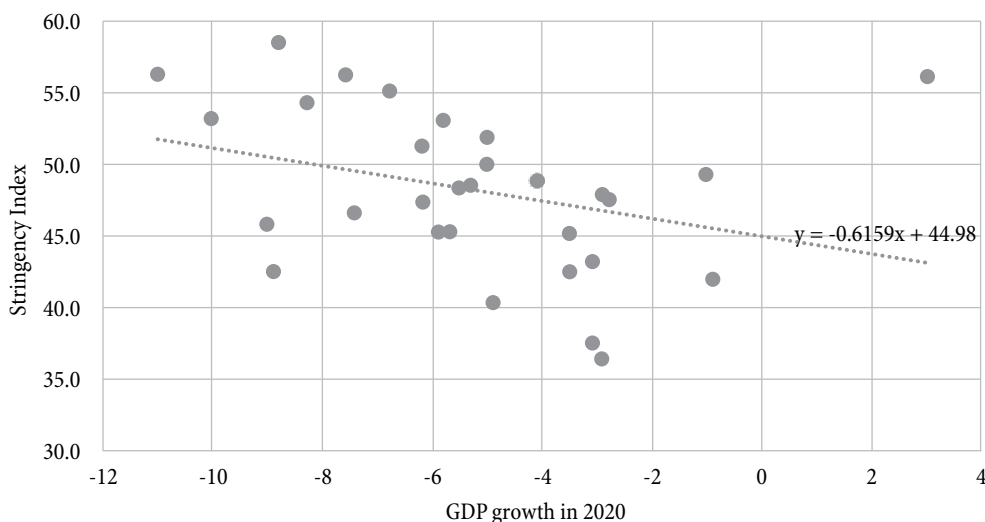
Source: Author's calculations.

### Structure of the economy

Data presented in Figure 3 indicate a high variation of the impact of the COVID-19 pandemic across industrial sectors in the EU – trade, travel and tourism being the most heavily affected, with negative impact on manufacturing and construction also being pronounced. This may suggest that sectoral structure of the economy and the intensity of decline in the most heavily affected sectors are expected to have a significant impact on the overall outcomes, in terms of the total output during 2020.

<sup>3</sup> Albania and Bosnia and Herzegovina only. The data on North Macedonia and Montenegro are not available.

**Figure 5: Relationship between GDP growth and the Stringency Index in 2020**



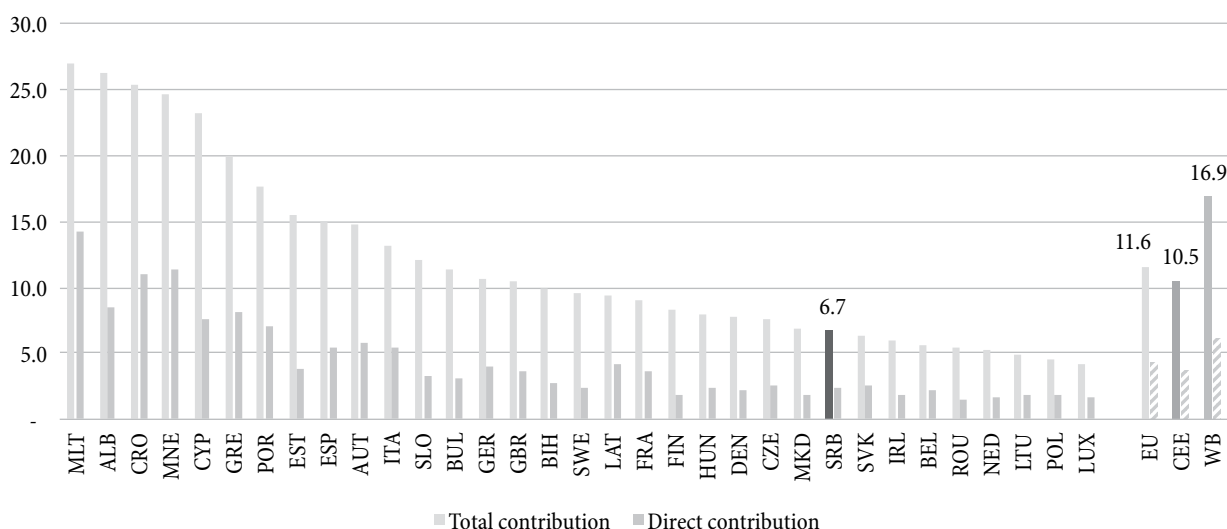
Source: Author's calculations.

According to the World Bank data, direct contribution of tourism and travel to GDP in Europe is ranging from less than 2 percent in Romania, Finland, Poland, Lithuania and the Netherlands to 10-14 percent of GDP in Malta, Montenegro and Croatia, the EU average being 4.3 percent of GDP (Figure 6). It should also be noted that direct contribution of tourism and travel to GDP in the Western Balkan countries is more pronounced (6.1 percent of GDP on average), mostly due to high contributions in Albania and Montenegro. However, when the spillover effects on other industries are added, the total contribution of the tourism and travel sector to GDP rises by the factor of 2.7 on average. Thus, the total contribution of this sector to the EU countries' GDP is estimated to be 11.6 percent

of GDP, while in the Western Balkan countries it reaches almost 17 percent of GDP.

The data presented in Figure 7 provide a stylized insight into the strong negative relationship between the share of tourism in GDP and the 2020 GDP growth rate in Europe, which may be the consequence not only of the large share of tourism and travel in GDP, but also of the size of recession of this sector in 2020. Estimates of the impact of the pandemic on travel and tourism in Europe, based on a real-time big dataset of 45 million AirBnB customer reviews, indicate that the number of total nights spent in tourist accommodations in 2020 was halved, the largest decline (of 55-73%) being observed in Greece, Malta, Ireland, Spain, Cyprus and Croatia [5]. Data

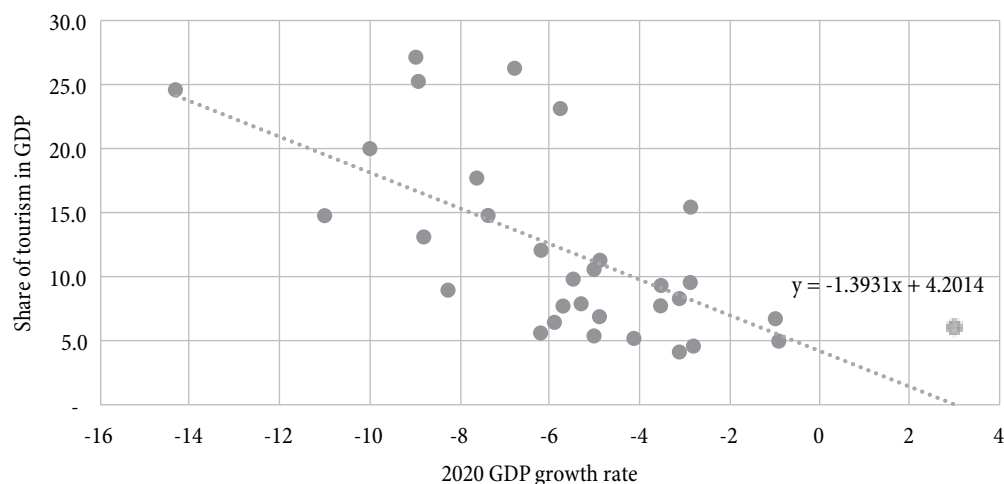
Figure 6: Contribution of tourism and travel to GDP (2017-2019 average)



Source: Author's calculations based on the World Bank data.

\* Available at [https://tcdata360.worldbank.org/indicators/tot.direct.gdp?country=BRA&indicator=24648&viz=line\\_chart&years=1995,2028#table-link](https://tcdata360.worldbank.org/indicators/tot.direct.gdp?country=BRA&indicator=24648&viz=line_chart&years=1995,2028#table-link).

Figure 7: Relationship between the share of tourism in GDP and 2020 GDP growth rate



Source: Author's calculations based on the World Bank data.

on the share of tourism and travel in GDP and estimates of 2020 results of this sector indicate that the decline in tourism and travel was especially high in the countries that generate a rather large share of their GDP from this sector (Greece, Malta, Spain, Croatia, Cyprus, Italy and so forth), which resulted in a deep drop in real GDP in these countries in 2020.

According to the World Bank data, travel and tourism make a direct contribution to Serbia's GDP of 2.3 percent, while the total contribution reaches 6.7 percent of GDP, which is 2.5 times less than the Western Balkans average and 1.7 times less than the EU average. In addition to that, data presented in Figure 3 show that the real decrease in GVA of the trade, travel and tourism sector in Serbia in 2020 was lower by 58% than the decrease observed in the EU-27, which may be due to the fact that the Serbian tourism sector relies less on foreign tourists, unlike many other European countries. Therefore, the lower decline of Serbia's GDP in 2020 in comparison with the EU, CEE and Western Balkans average may also be explained by the favorable sectoral structure of the economy, i.e., by the lower share of travel and tourism in the economy and a slighter decline of this sector in Serbia. In addition to that, the share of sectors that have been more insulated from the impact of the pandemic (e.g., agriculture, utilities, food processing and so forth) in Serbia is well above the European average, which suggests that the sectoral structure of the economy may have played a significant role in shaping overall output results of Serbia in 2020.

### Fiscal policy

Fiscal expansion is employed in bust periods in order to flatten out the recession line and speed up the recovery.

This is why ever since the onset of the COVID-19 crisis, most of the European governments have implemented massive fiscal stimuli in order to prevent large-scale bankruptcies and spikes in unemployment. Empirical studies [5] show that fiscal and monetary stimuli have been effective in mitigating some of the economic costs of the COVID-19 crisis. Fiscal stimuli programs implemented by the governments during the COVID-19 pandemic can be divided into two groups: direct support – additional spending and foregone revenue (wage subsidies, additional healthcare spending, investment, deferral of tax payments and so forth) and indirect support – equity, loans and guarantees (aimed to support liquidity of businesses).

The IMF Fiscal Monitor Data (Table 2) indicate that the total amount of fiscal stimulus packages is positively related to the level of development, which is explained by the stronger fiscal capacity of more developed countries to provide additional funds in the crisis periods. A similar finding is suggested by the data on Europe (Figure 8). To estimate the size of 2020 fiscal stimulus (FS) per country, we relied on the Eurostat data on GDP growth (Y) and fiscal balance (FB). The drop in economic activity had an automatic negative effect on fiscal balance, mostly through decline in tax revenues, which depends on the elasticity of tax revenues to GDP that may be proxied with the share of tax revenues in GDP (t). Therefore, direct fiscal stimulus is calculated by insulating the automatic rise in fiscal deficit in 2020 (compared to 2019) from the increase in fiscal deficit linked to discretionary policy actions:

Data presented in Figure 8 show that direct fiscal stimuli in Europe in 2020 were also varying significantly across the countries, with the EU-27 average being close to 3.6 percent of GDP, which is higher than the CEE and Western Balkans average.

**Table 2: Discretionary fiscal policy response to COVID-19**

	Advanced economies	Emerging economies	Low-income economies	Serbia
	Percentage of GDP			
Additional spending and forgone revenue	12.7	3.6	1.6	5.6
Equity, loans, and guarantees	11.3	2.5	0.2	1.4
	24.0	6.1	1.8	7.0
	Share in discretionary fiscal response			
Additional spending and forgone revenue	53%	59%	88%	80%
Equity, loans, and guarantees	47%	41%	12%	20%

Source: Author's calculations based on the IMF Fiscal Monitor Dataset.

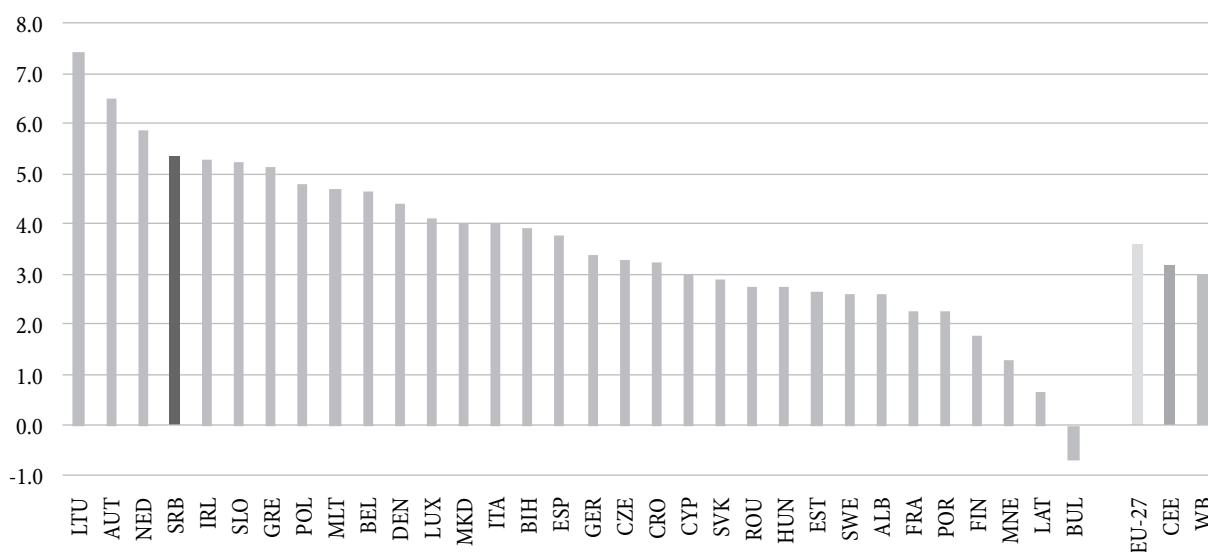


According to the Keynesian approach, efficiency of fiscal expansion in promoting economic growth in open economy depends on the size of fiscal stimulus, as well as on marginal propensity to save and marginal propensity to buy importable goods – larger fiscal stimulus and lower marginal propensity to save and to import imply stronger positive effects of fiscal expansion on economic growth (see [2]). Empirical studies suggest that the size of fiscal multipliers is larger in the advanced rather than in the developing countries, as well as in economies that operate fixed exchange rates [6]. The same study indicates that fiscal multipliers are positively linked with the degree of openness of the economy, while the link with the level of public debt is negative. Empirical literature on the CEE region also indicate that fiscal multipliers depend on the

structural features of fiscal policy, multipliers with public investment being particularly high [5]. Data presented in Figure 9 indicate a positive relationship between the size of direct stimuli and the GDP growth observed in 2020, which may suggest that fiscal policy response to the crisis has also played an important role in shaping output outcomes.

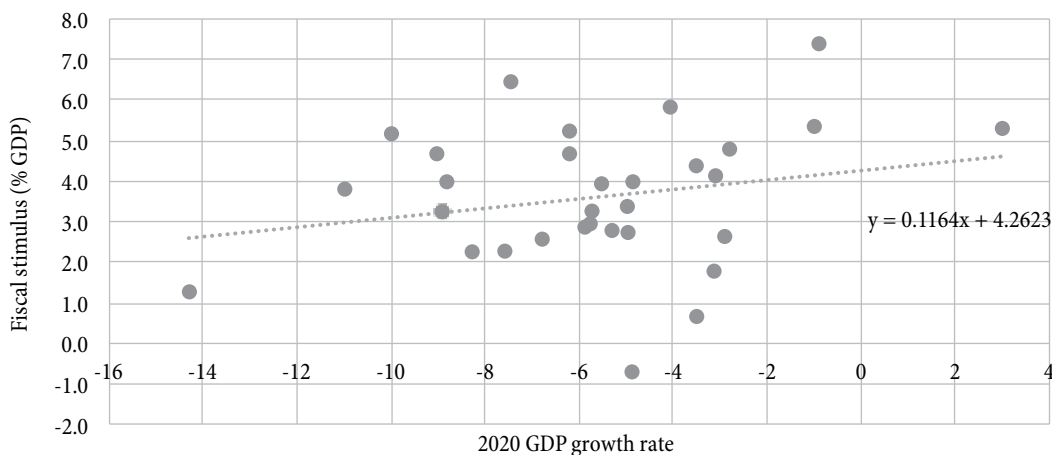
In 2020, Serbia has implemented two programs of fiscal stimuli, which have included wage subsidies, deferral of tax payments, unconditional flat transfers to all adult citizens, loans, guarantees and equity contributions [5]. Wage subsidies, which accounted for a large chunk of total fiscal stimuli in Serbia, were mostly nonselective, which was also the case with (100 Euro) transfers to citizens. The total fiscal stimulus of Serbia in

Figure 8: Direct fiscal stimulus in 2020 (% GDP)



Source: Author's calculations.

Figure 9: Relationship between GDP growth and direct fiscal stimulus



Source: Author's calculations.

2020 is estimated at around 7 percent of GDP, which is above the average size of the fiscal stimulus in emerging economies comparable with Serbia in terms of their level of development (Table 1). However, the structure of the fiscal stimulus package in Serbia, with 80% being provided through direct support, is more similar to the structure found in low-income countries. Due to the large total fiscal stimulus and a large share of direct support programs, the direct fiscal stimulus (relative to GDP) in Serbia in 2020 was well above the EU-27, CEE and Western Balkans average (Figure 8). These data suggest that only three European countries (Lithuania, Austria and the Netherlands) have implemented more buoyant direct fiscal stimuli in 2020 than Serbia. This may suggest that a strong fiscal policy response may also be seen as an important explanation for above-the-average output performance of Serbia in 2020.

Strong fiscal policy response was needed in unprecedented times, and Serbia's fiscal policy response in that respect was to a large extent comparable with policy interventions in other European countries. However, considering the available theoretical and empirical facts, a more targeted fiscal support (focused on the most affected sectors, unemployed individuals and socially vulnerable groups) may have had a greater positive impact on the growth perspective and general social welfare.

## Conclusion

The outbreak of the COVID-19 pandemic triggered unprecedented challenges to daily life, public health and economy globally. In order to curb the pandemic, countries have been implementing different containment strategies. These policies have been helpful in preventing the collapse of healthcare systems, but at the same time causing disruption in business operations, thus generating economic costs. In parallel to containment policies, most of the countries have implemented economic support programs in order to mitigate or at least to partially offset economic costs of the pandemic. Variation in structural features of European countries (population age and density, geographical location, properties of the healthcare systems, openness to international travelers and so forth),

differences in containment strategies and characteristics of the economic response to the crisis resulted in a significant variation in GDP growth rates in 2020 across Europe. This paper provides an overview and critical evaluation of the three groups of factors which may explain the variation in output volatility during the pandemic.

**Table 3: Correlation matrix**

Correlation between GDP growth in 2020 and...	
...stringency of containment policy	-0.32
...share of travel and tourism in GDP	-0.66
...size of the fiscal stimulus	0.23

Source: Author's calculations.

The results have shown that GDP growth rates in 2020 in Europe were strongly negatively associated with the share of travel and tourism in GDP and moderately negatively linked with the stringency of containment policy, while the correlation with the size of direct fiscal stimulus programs was positive, albeit modest (Table 3). This means that the stringency of containment policy, sectoral structure of the economy and fiscal response to the crisis may have played a role in shaping the output dynamics in 2020. The results should be interpreted with caution, since there are also other factors that may have influenced output dynamics in Europe and Serbia, including the size and structure of monetary stimuli, precrisis growth trends and so forth. In order to provide robust conclusions on the absolute and relative significance of these three groups of factors, their impact should be estimated econometrically by controlling for the influence of other factors.

The data presented in this paper also indicate that Serbia performed relatively well in terms of output dynamics in 2020. At the same time, Serbia was implementing relatively loose containment measures for the most part of the year and a highly expansionary fiscal policy, at the same time having favorable sectoral structure of the economy (in terms of insulation against the pandemic shocks). Critical assessment of Serbia's fiscal policy response leads to the conclusion that a large part of the fiscal intervention was in line with good international practice. However, fiscal interventions could have been more targeted in certain aspects (aimed at the affected sectors and households) in order to attain better results with the same size of the

fiscal intervention or to achieve similar economic effects with lower fiscal costs.

## Acknowledgement

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## References

1. Baqaee, D., & Farhi, E. (2020). *Supply and demand in disaggregated Keynesian economies with an application to the Covid-19 crisis*. National Bureau of Economic Research Working Paper No. w27152.
2. Caves, J., Frankel, J., & Jones, W. (2007). *World trade and payments – An introduction* (10th ed). London: Pearson.
3. Deb, P., Furceri, D., Ostry, J. D., & Tawk, N. (2020). *The economic effects of Covid-19 containment measures*. CEPR Discussion Paper No. DP15087.
4. European Commission. (2020). *EU candidate countries' & Potential candidates' economic quarterly*. Technical Paper No. 044.
5. European Commission. (2021). *European economic forecast, winter 2021*. Institutional Paper No. 144.
6. Ilzetzki, E., Mendoza, E. G., & Végh, C. A. (2013). How big (small?) are fiscal multipliers?. *Journal of Monetary Economics*, 60(2), 239-254.
7. IMF. (2020). *World economic outlook, April 2020: The great lockdown*. World Economic Outlook Reports. Washington DC: IMF.
8. IMF. (2021). *Fiscal monitor database of country fiscal measures in response to the COVID-19 pandemic*. Washington DC: IMF.
9. König, M., & Winkler, A. (2021). COVID-19: Lockdowns, fatality rates and GDP growth. *Intereconomics*, 56(1), 32-39.
10. Petrović, P., Arsić, M., & Nojković, A. (2021). Increasing public investment can be an effective policy in bad times: Evidence from emerging EU economies. *Economic Modelling*, 94, 580-597.
11. FREN, & University of Belgrade – Faculty of Economics. (2020). *Quarterly Monitor of Economic Trends and Policies in Serbia*, No. 63. Retrieved from: <https://fren.org.rs/vesti/kvartalni-monitor-br-63/>
12. Surico, P., & Galeotti, A. (2020). *The economics of a pandemic: The Case of Covid-19*. Retrieved from <https://icsb.org/theeconomicsofapandemic/>.



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