The Effects of Covid-19 Pandemic on Economic Development of Western Balkan Countries

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Abstract The spread of Coronavirus around the globe was in a relatively short period of time, resulting in the most severe socio-economic crisis in the modern history. Therefore, the aim of this research article is to estimate the effects of COVID-19 pandemic on the main economic indicators through an empirical investigation, using annual data for the period 2001–2020. The research methodology consists of a panel regression analysis, including a dummy variable for the COVID-19 crisis, taking the value 1 for the years 2020–2021 and 0 otherwise. The empirical results reveal that COVID-19 had strong negative impact on the real sector in the Western Balkan countries, mostly affecting the countries' output, while causing minor increase in the average unemployment rate and keeping the average price level stable.

Keywords Covid-19 · Economic output · Unemployment rate · Panel regression · Western Balkan

1 Introduction

COVID-19 pandemic was a bitter reality in the recent time. Due to the high and expanding degree of globalization, the coronavirus spread around the globe in a relatively short period of time, resulting in the most severe socio-economic crisis in the present history.

Western Balkan countries, as small and open economies depending on the international trade, and strongly relying on the growth and development of the real sector,

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experienced significant macroeconomic shock that will unquestionably result in long-term economic and social consequences. This region is encompassed by 6 countries that are strongly determined to integration in the European Union. Although several facets can be analysed, the emphasis of this research paper is on the impact of COVID-19 to the real sector in the Western Balkan region. For this purpose, it was employed a well-defined methodological approach aiming to reveal the severity and direction of impact of COVID-19 on the GDP growth rate, unemployment rate and inflation rate.

The containment measures undertaken by the respective authorities at the beginning of pandemics unequivocally had an impact on domestic demand and supply, significantly decreasing economic activity. The supportive macroeconomic policies aid the recovery of demand even though did not completely offset the economic consequences of enforced shutdowns during the 2020 year. However, based on the Western Balkans Regular Economic Report (Fall 2021) reports that the economies of the Western Balkans are coming out of the economic crisis caused by COVID-19 pandemic, compared to global trends. Economies are recovering faster than it was foreseen since the lockdown measures were eased and external demand is picking up. After a contraction of 3.1% in 2020, the Western Balkans is expected to grow by 5.9% in 2021, 1.5 percentage points more than projected.

The COVID-19 pandemic has seriously injured the world economy with grave consequences impacting all communities and individuals. However, after almost of two and half years, the health and economic impact of the COVID-19 pandemic are not still well recognized. Rapid spread of new variants has increased uncertainty about how quickly the pandemic can be overcome. Policy choices have become more difficult, with limited room to manoeuvre (IMF 2021). As of today, based on the World Health Organization data an estimate of 318 million people has contracted the virus worldwide, and over 5.5 million died from the disease.

The coronavirus pandemic led to substantial revisions of 2020 GDP growth projections (König and Winkler 2021). According to the International Monetary Fund (2021), the global economy is projected to grow 5.9% in 2021 and 4.9% in 2022, 0.1 percentage point lower for 2021 than in the July forecast. The downward revision for 2021 reflects a reduction for advanced economies—partly due to supply disruptions—and for low-income developing countries, mainly due to deteriorating pandemic dynamics. This is partially offset by stronger near-term predictions among some commodity-exporting emerging markets and developing economies.

2 Brief Review of the Literature

Although for a short period of time, a large body of literature is produced by different authors concerning the severe impacts of COVID-19 in different spheres. For instance, Brodeur et al. (2021) explore the transmission channels for understanding the potential negative economic impact of COVID-19. They state that it is important to comprehend the economic transmission channels through which

the shocks will adversely affect the economy. As summarized by Brodeur et al. (2021), there are three main transmission channels according to Carlsson-Szlezak et al. (2020). The first channel has to do with the decrease in the consumption of goods and services because of restrictive measures that affect the reduction of consumer confidence and their decisions about long-term economic prospects. The second is related to the indirect impact of the financial market on the real market, which will significantly affect the decrease in family income and, consequently the increase in savings and the decrease in consumption. The third channel has to do with the supply side since the restrictions hinder the production activities of the firms and negatively affect the supply chains and the labour demand that in turn increases the unemployment. Baldwin and Tomiura (2020) deliberate both the supply shock and the demand shock of COVID-19 on international trade of goods and services. Based on their study the supply disruptions and demand shocks of large economies such as US, China, Japan, Germany, UK, France, India, Italy, Brazil and Canada will depressingly affect the global economy, especially the world trade will sluggish considerably.

Baqaee and Farhi (2020) examine the supply and demand shocks in a disaggregated Keynesian model embraced by multiple sectors, several factors, input–output linkages, wage rigidities and credit constraints. They construct a model to investigate how the supply and demand shocks affect output, unemployment and inflation. They realize that negative sectorial supply shocks are stagflation, while negative demand shocks are deflationary that in effect, both can cause unemployment. Using the USA data, they find that supply and demand shocks explain about half of the reduction of real GDP because of COVID-19 crisis.

König and Winkler (2020) inspect how the anti-crisis policies undertaken by governments influence cross-country differences, regarding the economic impact of COVID-19 pandemic as projected by different international institutions such as IMF, World Bank and OECD. They measure policy quality using the Economist Intelligence Unit index and a COVID-19 Misery index, combining the strictness of government-imposed distancing measures with the COVID-19 fatality rate. Besides, they scrutinize for international spillovers apprehended by trade openness and export acquaintance to tourism. Their results for most specifications designate that good government performance pays off as the respective countries register less severe revisions of economic growth forecasts.

Eichenbaum et al. (2020) develop a canonical epidemiology model to analyse the interactions between economic decisions and epidemics. They find that epidemic produces both supply and demand upshots on the economic activity. The mitigation measures cause the aggregate consumption to fall by 9.3% over a 32-week period. On the other side, labour supply appears in a U-shaped pattern, by a peak deterioration of 8.25% in the 32nd week from the beginning of the pandemic. The chief note of their analysis is that there is an unavoidable trade-off between the severity of the short-run recession triggered by the epidemic and the health consequences of that epidemic. Consequently, the policymakers deal with this trade-off.

Eppinger et al. (2020) employ a quantitative multi-country multi-sector trade model with input–output relations for a set of countries to estimate the influence

of COVID-19 supply shock on global value chains (GVCs). They find considerable welfare losses in China more than 30% because of supply shock, but only moderate welfare effects in other countries, fluctuating from −0.75 to +0.12%.

Lewis et al. (2020) built regression models using a weekly economic index and incorporating 10 different economic variables to examine the economic effect of covid-10 in the US. Based on the analysis, it was found that from March 21 to March 28, the weekly economic index fell by 6.19%. This came because of the decrease in fuel sales, the decrease in consumer confidence, as well as from the change of other variables. The authors point out that in normal times macroeconomic aggregates accurately present the economic situation with a modest delay, while in times like the pandemic some data sources can provide an informative and timely signal of the economic situation. This means that the weekly economic index provides an accurate summary of that signal.

Chetty et al. (2020) built a database that tracks economic activity in real time and using anonymized data from private companies. There, the authors report weekly statistics on business income, consumer spending, employment rates and more. Then the authors analysed the effect of COVID-19 on the economy considering the heterogeneity and its impact on groups with different incomes. The study highlights that people with high incomes significantly reduced their expenses at the beginning of the pandemic, which greatly affected the decrease in the income of small businesses in wealthy areas, and as a result many workers were laid off. Even in the moments when the economy started to recover somewhere from the end of December 2021, the labour supply was low for low-wage jobs. The authors even reveal that the stimulating fiscal policies had a positive effect in stimulating demand at the beginning of the pandemic, but much less later.

König and Winkler (2021) investigate the influence of obligatory social distancing required by lockdown policies and social distancing caused by COVID-19 fatality rates on economic growth including 42 countries in their sample. According to OLS and IV results, it was found a significant effect of fatality rate. Regarding the panel regressions, it was confirmed that lockdown strictness affected the most the economic growth. Models with lagged variables reveal that more restrictive measures lead to lower GDP growth in the same quarter then are linked with a positive and recovery effect in the subsequent quarter.

Asahi et al. (2021) evaluate the impact of restrictive measures on local economic activity using econometric techniques and a broad data base for the country of Chile. Their analysis is based on the measurement of economic activity based on the collection of taxes at the municipality level. The results show that those municipalities that had strict restrictive measures were accompanied by a 10–15% decrease in local economic activity, which is twice the decrease in local economic activity compared to municipalities that were not under isolation. This shows that three to four months of isolation had a similar effect on economic activity as a year of the recession of global financial crisis of 2009. They also found that costs are proportional to the population under lockdown, with no differences when congestion was measured at the municipality or city levels. Their findings imply that localized foreclosures have a large effect on local economic activity, but these effects are proportional to the

population under foreclosure. This means that epidemiological criteria and isolation decisions should be based on the optimal size of isolated areas.

Danielli et al. (2021) conducted an analytical study reviewing the existing information related to economic interventions and government measures to mitigate the negative effects of COVID-19. They found that government measures have been substantial for some countries, ranging from 2.5 to 50% of Gross Domestic Product.

This study is different from those reviewed above as it analyses the effect of COVID-19 on economic developments from another perspective, i.e. alongside the analysis of the effect and its size, which will be an added value to the existing literature on this topic.

3 Methodology and Data

The methodology of this research consists of panel regression analysis and the estimation method used is two-stage least squares (2SLS). It is based on the reduced form of the model equations, representing the dependent variable as a function of only predetermined variables (exogenous and lagged variables) and a disturbance term, thus avoiding the potential bias that will occur if ordinary least squares method were used (Gujarati and Porter 2009, p. 673).

Due to availability of data for this set of countries, the study uses annual data for the period 2001–2021, obtained from the World Bank's database, for 6 Western Balkan countries, namely, Albania, Bosnia and Hercegovina, Kosovo, Montenegro, North Macedonia and Serbia. In other words, it is a panel data, with 6 cross section units (countries) and 21 time periods (years), providing a sample of maximum of 126 observations. However, due to missing data, the final data sample, after adjustments, is 106 observations. To prevent further loss of degrees of freedom because of missing data, the moving average method was used to supplement some of those missing observations, mostly for Kosovo and Montenegro. This is one of the statistical techniques available for tackling issues with missing data, which is simple to apply, yet most suitable for this case.

The empirical analysis is concentrated on the real sector. Specifically, the impact of COVID-19 on the real sector in the sample countries is observed through three-panel regression models, i.e. the dependent variables are considered the annual GDP per capita growth rate, the unemployment rate and the inflation rate, respectively. The GDP growth rate refers to the overall economic activity using the per capita economic growth in the country. On the other hand, the unemployment rate is specifically focused on the utilization of the labour force potential. Another important aspect necessary to cover all aspects affecting real sector is price stability. Although one might argue that it is primarily a monetary phenomenon, it undoubtedly has strong influence on the economy in general, especially private consumption and investment. Therefore, the inflation rate is also taken as a proxy indicator for the real sector.

To isolate the impact of COVID-19 and to prevent potential omitted variable bias, several variables are used in the models as exogenous, or control variables.

Table 1 Exogenous (control) variables used in the analysis

Control variables	Indicator	Proxy indicator
GDP_PC	GDP per capita (constant 2010 US$), t − 1	Economic development
CAB	Current account balance (% of GDP)	International integration
TRADE	Trade (% of GDP)	
MONEY	Broad money (% of GDP)	Financial stability
RIR	Real interest rate (%)	
LIQUID	Bank liquid reserves to bank assets ratio (%)	Stability of the banking sector
SAVINGS	Gross domestic savings (% of GDP)	Credit base
FCE_GG	General government final consumption expenditure (% of GDP)	Government intervention
DCPSB	Domestic credit to private sector by banks (% of GDP)	Economic activity
GFCF	Gross fixed capital formation (% of GDP)	
POP	Population, total	Labour force

These variables represent different factors related to the real sector, such as the level of economic development, international integration, macro-financial stability, economic activity and economic potential, as well as the government intervention.

As key independent variable used in the analysis, dummy variable for the COVID-19 crisis, taking values 1 for the years of 2020–2021 and 0 otherwise, is used in the three econometric models. The coefficient of this variable represents the effect of the COVID-19 crisis on the observed dependent variables, i.e. it investigates if is there any structural change between the two time periods. It is represented in all models, and it is of primary interest and importance for this empirical analysis.

The selection of the control variables is done based on the conventional macroeconomic wisdom, as well as the empirical literature in the area. In its early phase, the analysis covered more control variables that potentially affect the endogenous variables, however, due to various reasons (missing data, or statistical insignificance), they were narrowed down to the following, presented in Table 1.

3.1 Specification of Econometric Models

The three models used for estimating the effects of COVID-19 pandemic on the real sector are specified as in the following three equations. In the first model GDP per capita growth is well-thought-out as dependent variable. In the second and third models, unemployment rate and inflation are considered as dependent variables, respectively.

$$\begin{aligned}\mathrm{GDP}_g = {} & \beta_{1.0} + \beta_{1.1}\mathrm{DUM} + \beta_{1.2}\mathrm{UN} + \beta_{1.3}\mathrm{INF} + \beta_{1.4}\mathrm{RIR} + \beta_{1.5}\mathrm{FCE}_{gg} \\ & + \beta_{1.6}\mathrm{CAB} + \beta_{1.7}\mathrm{TRADE} + \beta_{1.8}\mathrm{GFCF} + \beta_{1.9}\mathrm{DCPSB} + u_1 \end{aligned} \quad (1)$$

$$\begin{aligned}\mathrm{UN} = {} & \beta_{2.0} + \beta_{2.1}\mathrm{DUM} + \beta_{2.2}\mathrm{Log}\left(\mathrm{GDP}_{pc_{t-1}}\right) + \beta_{2.3}\mathrm{INF} + \beta_{2.4}\mathrm{FCE}_{gg} \\ & + \beta_{2.5}\mathrm{GFCF} + \beta_{2.6}\mathrm{DCPSB} + \beta_{2.7}\mathrm{TRADE} + \beta_{2.8}\mathrm{Log(POP)} + u_2 \end{aligned} \quad (2)$$

$$\begin{aligned}\mathrm{INF} = {} & \beta_{3.0} + \beta_{3.1}\mathrm{DUM} + \beta_{3.2}\mathrm{UN} + \beta_{3.3}\mathrm{GDP}_g + \beta_{3.4}\mathrm{MONEY} + \beta_{3.5}\mathrm{LIQUID} \\ & + \beta_{3.6}\mathrm{RIR} + \beta_{3.7}\mathrm{SAVINGS} + \beta_{3.8}\mathrm{DCPSB} + \beta_{3.9}\mathrm{CAB} + u_3 \end{aligned} \quad (3)$$

If omitting relevant independent variable of the model causes biased coefficient estimates, including redundant independent variable affects their efficiency. Namely, obtained estimates do no longer have smallest variance. For this purpose, stage 2 in the estimation process of the above theoretical model would be exclusion of statistically insignificant control variables. In other words, a restriction would be imposed to the theoretical model, equating the insignificant coefficients. The goal is to end up with estimated model with only statistically significant control variables and the key independent (dummy) variable, to objectively assess its impact and derive reliable conclusions.

The two-stage least squares method requires including enough instruments, in order for the model to be identified and possible to estimate. In this regard, the analysis takes all control variables from the system as instruments for estimation of each model equation, plus the key independent (dummy variable).

In addition, given that the analysis is focused on a group of countries, rather on a single country at a time, one should encompass this information properly in the model. In this regard, panel data analysis offers three different estimation techniques: pooled regression, fixed effects model and random effects model. Pooled regression basically disregards the aforementioned information and treats the data as a single time series. On the other hand, fixed and random effects model utilizes it, but in a different way. Namely, fixed effects model is based on a country specific dummy variable, further related to the intercept in the equation, whereas random effects model encompasses the country specifics in the error term, while using generalized least squares method for coefficient estimation (Brooks 2008, pp. 490–493). In practice, the Hausman test is most often used to decide which estimation technique is more appropriate. However, since the number of cross-sections is significantly lower than the number of time periods in the dataset, as well as the number of parameters in the equations, it is impossible to apply random effects model in this case. Therefore, the analysis is based on the fixed effects model, as the only applicable solution.

4 Empirical Analysis and Findings

Based on the obtained results of the model estimation, presented in the following table, we can see that the theoretical (unrestricted) model for per capita GDP growth rate is statistically significant (F-statistics = 10.18, with p-value = 0) and it is well fitted (R-squared coefficient = 0.64 and Adjusted R-squared coefficient = 0.59). Also, regarding the selection of instrument variables, estimated Sargan J-statistics is statistically insignificant (p-value = 0.6940), meaning that the over-identifying restrictions are valid (Sargan 1958).

However, one can note that there are several insignificant variables in the unrestricted model, or variables whose coefficients have p-values greater than 0.05. Therefore, these variables are gradually excluded from the model. After exclusion of these redundant variables, the overall statistical significance and model fit have significantly improved. The F-statistics in the restricted model is 16.98, whereas the adjusted R-squared coefficient jumped to 0.63 (Table 2).

According to the restricted (final) model, GDP growth rate in the Western Balkan countries primarily depends on factors related to international trade and integration, whereby external balance of goods and services and trade have positive impact on the economic growth, whereas current account balance has negative impact. Furthermore, investments (GFCF) have significant positive impact on the economic growth in the Western Balkan countries, with estimated coefficient of around 0.7, meaning

Table 2 Equation 1—GDP growth rate—estimated coefficients

DV: GDP_G	Unrestricted		Restricted	
Variable	Coeff.	*P*-value	Coeff.	*P*-value
C	−34.0015	0.0943	−13.5119	0.0977
DUM	−2.1422	0.0342	−4.8115	0.0000
CAB	−0.5221	0.0881	−0.5282	0.0011
TRADE	0.9272	0.0254	0.1107	0.0000
GFCF	0.7760	0.0022	0.6612	0.0032
DCPSB	−0.4115	0.0451	−0.4008	0.0000
FCE_GG	0.7211	0.9442		
UN	0.3266	0.1510		
INF	−0.4550	0.5201		
RIR	−0.1923	0.3817		
R-squared	0.64		0.76	
Adjusted *R*-squared	0.59		0.63	
F-statistic	10.18		16.98	
Prob (*F*-statistic)	0.0000		0.0000	
Prob (*J*-statistic)	0.6940		0.5511	

Source Author's calculation

that increase of the gross fixed capital formation of 1 percentage point would cause average increase in the GDP growth rate in the Western Balkan countries of 0.7 percentage points. However, indebtedness of the private sector might be potential growth jeopardizing factor in the Western Balkans. Namely, further increase in the domestic credit to private sector for 1 percentage point would cause average decrease in the GDP growth rate of around 0.40 percentage points. In contrast, monetary factors like interest rates, or inflation rate, as well as government final consumption and unemployment rate, do not have statistically significant impact on the GDP growth rate. There might be various reasons for this, beyond the scope of this master thesis.

Most importantly, estimated coefficient for the introduced dummy variable related to the COVID-19 pandemics is negative and statistically significant. This means that during the last year, Western Balkan countries experienced average decline in the GDP growth rate of −4.8%, holding other factors constant.

Regarding the unemployment rate, estimated model has significantly higher fit, compared to the GDP growth rate model. Namely, *R*-squared coefficient is around 0.83, meaning that 83% of the variations in the unemployment rate are explained by the selected independent variables.

Similarly, as in the GDP growth rate model, government final consumption expenditure and inflation rate do not have significant impact on the unemployment in the Western Balkans. On the other hand, population growth, as a labour force potential, has negative impact (decreases) on unemployment, along with the level of economic development, as observed through the previous year GDP per capita. Investments, international trade, as well as trade in general, also have negative impact (decrease) on unemployment, unlike domestic credit to private sector, which is another evidence in favour of the intuition for the negative macroeconomic implications of further indebtedness of the private sector (Table 3).

Regarding the impact of COVID-19 on unemployment in the Western Balkans, it has significant, but negative impact. Unlike the initial thoughts, COVID-19 not only did not increase unemployment, but decreased for almost 4.0 percentage points on average. This finding goes in favour of the effectiveness of the governments' recovery measures aimed at preventing job losses. Another important aspect might be the ability of the domestic companies to shift their business processes remotely, which is also an indicator of the technological progress of the region, in terms of technological advancement and ICT infrastructure. However, the reasons for this finding should be sought in the individual country specifics of each country.

Keeping the trend of decreasing the unemployment rate in the Western Balkan region might be the key for fast economic recovery in the post-COVID period. Namely, despite the significant fall in the economic activity, decreasing unemployment rate prevents further aftershocks on the demand side, caused by drop in the final consumption of the private sector. Furthermore, it can be a basis for future development and faster economic growth in the years to come.

In line with the initial assumptions based on the data visualization, COVID-19 does not have significant impact on the average price level, as observed through the average inflation rate in the Western Balkan countries. The estimated model for

Table 3 Equation 2—unemployment rate—estimated coefficients

DV: UN	Unrestricted		Restricted	
A	Coeff.	Prob.	Coeff.	Prob.
C	8.2610	0.1423	15.7150	0.0346
DUM	−3.1321	0.0127	−3.9171	0.0041
LOG(GDP_PC(-1))	−11.3312	0.0012	−9.3348	0.0005
GFCF	−0.4277	0.0033	−0.7341	0.0017
DCPSB	0.3221	0.0585	0.3277	0.0221
TRADE	−0.7843	0.0000	−0.2721	0.0000
LOG(POP)	−9.1843	0.0310	−6.1151	0.0032
INF	−0.0993	0.5210		
FCE_GG	−0.2355	0.3245		
R-squared	0.77		0.83	
Adjusted *R*-squared	0.71		0.74	
F-statistic	43.25		52.62	
Prob (*F*-statistic)	0.0000		0.0000	
Prob (*J*-statistic)	0.8723		0.6572	

Source Author's calculation

Eq. 3 shows that the coefficient for the introduced dummy variable is insignificant at 0.05 significance level. In other words, we cannot reject the null hypothesis that the coefficient is equal to zero. Namely, in the estimated unrestricted model, this coefficient is negative and insignificant (−0.65), whereas in the restricted model, it is −0.9 but again statistically insignificant. Thus, the coefficient of interest of this study implies that COVID-19 pandemics did not cause any significant impact on the inflation rate in the Western Balkan countries (see Table 4).

The overall goodness of fit for this estimated model is 52% (*R*-squared coefficients), which implies that there might be factors, probably monetary, that affect the inflation rate, but are not included in the model as independent variables. Here pops out the limitation regarding data availability. Namely, the collection of many financial development and monetary indicators started after the global financial crisis of 2008, which emphasized the importance of such indicators. On the other hand, in the unrestricted model there are several factors that do not have significant impact on the average inflation rate, such as the economic growth rate, domestic credit to private sector, stability of the banking sector observed through the amount of liquid assets and surprisingly the monetary base. Namely, monetary base in the country is in direct control of the National bank, and it serves as an operative target for achieving higher monetary goals, among which is the inflation rate (Mishkin 2011).

In any case, the obtained results show that average inflation rate in the Western Balkan countries primarily depends on factors related to international trade, such as external balance of goods and services and current account balance, monetary factors, such as savings and interest rates, as well as unemployment.

Table 4 Equation 3—inflation rate—estimated coefficients

DV: INF	Unrestricted		Restricted	
Variable	Coeff.	Prob.	Coeff.	Prob.
C	−22.2131	0.0183	−15.1207	0.0731
DUM	−0.6531	0.5731	−0.9251	0.1702
UN	0.5482	0.0021	0.5172	0.0013
RIR	−0.2537	0.0005	−0.3990	0.0011
SAVINGS	0.1994	0.0260	0.2871	0.0420
CAB	0.7342	0.0012	0.8291	0.0010
GDP_G	−0.0502	0.5518		
DCPSB	0.3511	0.5441		
MONEY	0.2581	0.6120		
R-squared	0.52		0.63	
Adjusted *R*-squared	0.47		0.59	
F-statistic	17.32		24.11	
Prob (*F*-statistic)	0.0000		0.0000	
Prob (*J*-statistic)	0.2513		0.2451	

Source Author's calculation

When it comes to the relationship between inflation and unemployment, it has special treatment in the economic literature, known as Phillips curve. Namely, the literature suggests inverse relationship, meaning that higher inflation rate is associated with lower unemployment rate and higher economic growth, and vice versa (Dorm 2020).

Phillips curve is highly disputed Keynesian concept in the empirical literature, which happened not to be true for the Western Balkan region as well. One of the reasons for this might be the constantly decreasing trend of the unemployment rate in the past years, which started with extremely high rates of unemployment in the transitional years of the 1990s. However, those aspects of the analysis go beyond the scope of this study, and therefore, would not be discussed any further.

4.1 Limitations of the Study

The methodological approach has two major limitations. Namely, quality of the data might significantly affect the obtained results. Missing data, primarily for Kosovo and Montenegro, leads to significant decrease in the sample size, thus losing valuable degrees of freedom. Also, missing data for some finance variables, such as non-performing loans and capital adequacy ratio, significantly narrow the analysis, which can cause omission of relevant variables from the models.

Another aspect related to data quality is comparability. Countries might use different calculation methodologies for same indicators, jeopardizing cross-country comparison. To tackle this issue, the entire dataset is obtained from one reliable source, the World Bank's database. However, the risk of incomplete comparability is still not completely removed.

5 Conclusions

This empirical study reveals that COVID-19 had strong negative impact on the real sector in the Western Balkan countries, mostly affecting the countries' output, while causing slight increase in the average unemployment rate and keeping the average price level stable. Western Balkan countries experienced sharp decline in the economic activity. However, some countries had relatively easier consequences, unlike others, that were hit harder.

On average, COVID-19 impact caused decrease in the GDP growth rate in the Western Balkan countries by 4.8 percentage points.

As for the unemployment rate, the trend of constant decrease over the las two decades is evident. However, COVID-19 pandemics slightly increased unemployment rate in some Western Balkan countries (Kosovo, North Macedonia and Bosnia and Hercegovina), whereas Serbia, on the other hand, managed to keep the downward trend. The estimated coefficient in the structural equation for the unemployment rate is statistically significant and negative. This means that COVID-19 pandemics not only did not increase unemployment rate but affected it reversely. There are two possible reasons behind the resilience of the unemployment rate on the COVID-19 impact. One aspect is the effectiveness of the governments' recovery measures aimed at preventing job losses, and other is the ability of the domestic companies to shift their business processes remotely, which is also an indicator of the technological progress of the region, in terms of technological advancement and ICT infrastructure.

Regarding the overall stability of the price level, one can conclude that inflation rate in the Western Balkan countries is far less volatile in the past decade, in comparison with the period before the global financial crisis. During the years of 2020 and 2021, because of the lower economic activity, inflation rate in the Western Balkan countries was around 0, but it is expected to grow this and the next year, due to the undertaken economic recovery measures as well as the war in Ukraine and energy crisis. Estimated coefficient of the COVID-19 dummy variable in the structural equation for the inflation rate is statistically insignificant, meaning that COVID-19 pandemics did not affect the overall price level stability in the Western Balkan countries.

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