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### Three Decades of Macroeconomic Flux in Montenegro and Slovenia

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#### ABSTRACT

*The purpose of this research is to audit the time dependence of the long-run similarities in macroeconomic aspects. The macroeconomic flows in Montenegro and Slovenia, the two ex-Yugoslav countries, are analysed. The historical time series data for two variables on gross domestic product (GDP) per capita and unemployment rate are used to obtain the best normally distributed data vector for prediction and discussion. The novelty of the results is that we have used 29 years of long-run annual data for both countries since the 1990s from various international statistical data sources, which are analysed using applied econometric techniques, starting with regression analysis and concluded by the Granger Causality test. The null hypothesis approach is: unemployment rate does not cause GDP per capita and vice versa, or there is no statistically significant causal relationship. The empirical results confirm a statistically significant unidirectional causal relationship on two lags only for Montenegro, where unemployment causes national GDP per capita and not vice versa. On the other hand, no causal relationship was found for Slovenia. The empirical results may be important for policy makers as two macroeconomic aggregates were analysed in the relationship between the level of economic development driven by economic growth and the unemployment rate.*

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#### INTRODUCTION

During the "Brexit", pandemic crisis and "US-China trade war", there is increasing interest regarding implications of the European Union (EU) disintegration on labor market and EU national economies among policy and decision-makers (Solilova et al., 2019). On the other hand, there is a discussion on parallels between EU challenges and lessons learnt from communist Yugoslav disintegration (Becker, 2017; Bebler, 1993) starting in 1980-1981 (Bebler, 1993) and with the first multiparty presidential and parliamentary elections in 1990 (Pavlovic, 2019). Structurally, though, Scotland currently imagines as it is the Slovenia of the piece: the small northern republic, keen to prosper within the EU and struggling

against political shifts in the larger country that will prevent it doing so Becker (2016). The present research is motivated by time dependence in long-run similarities in macroeconomic aspects. More specifically, the article aims to analyze the time dependence of macroeconomic aggregates for Slovenia and Montenegro, the two ex-Yugoslav countries.

The present article aims to close the gap in the literature by analyzing the macroeconomic flux in Slovenia and Montenegro with two objectives. First, to collect historical data for analyzed two variables for two ex-Yugoslav countries and second, to analyze the causal relationship between two aggregates on a long-run relation: level of economic development measured by gross domestic product (GDP) per capita and unemployment (UNEMP) rate.

The remainder of the paper is organized as follows. The next section is reviewed the previous literature on the interaction and causalities between GDP per capita and UNEMP rate. This is followed by a section on methods and time-series data for Slovenia and Montenegro over the period 1990-2018. The econometric approach is applied with an individual visual inspection on data in natural logarithms following Juselius (2021). In the penultimate section are presented and discussed empirical results with their importance for economic development and labor market policies, while the final section concludes.

## 1. LITERATURE REVIEW

Keynes theory provides the basis for economic policies to combat unemployment by stimulating aggregate demand. The neoclassical growth model implies that the rate of technological change is the primary determinant of the steady-state equilibrium rate of growth in income per capita. Past shocks such as wars (Bebler, 1993), civil unrest (Legiedz, 2019), rapacious dictators (Pavlovic, 2019), economic scope (Bojnec, 1996), pandemic and Yugoslav (Bebler, 1993) or Brexit disintegration can also influence volatilities and differences in growth rates. The striking feature of the classical model is the supply-determined nature of output and employment on perfectly flexible prices and wages (Froyen, 2012), but neoliberal reforms can dismantle democratic institutions (Pavlovic, 2019).

In the recent article, the comparison of macroeconomic flux in the growth of the level of economic development measured by GDP per capita and job creation with a reduction in UNEMP rate in two countries. Boubtaneab et al. (2013) and Bartolucci et al. (2018) have framed the discussion on the relationship between economic growth and unemployment levels. The latter study also noted Okun's law as a statistical relationship that relies on a regression between UNEMP and GDP, which is also applied for Montenegro by Karadzic and Backovic (2021). As such, running the regression can result in differing coefficients that are used to capture the change in unemployment, depending on how the economy grew. The results can be based on the historical periods for GDP per capita and UNEMP data. Therefore, we aim to introduce the historical path in two macroeconomic time-series in an econometric decision-making model.

Previous studies relating the unemployment gap (or the unemployment rate) to the output gap and labor market institutions mostly look at a subset of Organisation for Economic Co-operation and Development (OECD) countries (Chugunov et al., 2016). Among them is Slovenia, but not Montenegro (OECD, 2021). Therefore, it is worth studying evidence and comparison between Slovenia and Montenegro, which share a common history in the 20<sup>th</sup> century (Mihailović, 1963). Slovenia produced 16% of the ex-Yugoslav gross material product (GMP) and Montenegro had a GMP per capita below the ex-Yugoslav average (Uvalic, 1993)

In 1991, Slovenia became independent after the collapse of ex-Yugoslavia. Slovenia, therefore, began with its macroeconomic policy (Bojnec, 1996), whereas Montenegro became independent in 2006 (Karadzic et al., 2021). Up to date, there is limited contemporary research that investigates two macroeconomic variables: GDP per capita and UNEMP rate for 29 year-period. The UNEMP rate is one of the best-known labor market measure as a useful measure of the underutilization of the labor supply. It reflects the inability of an economy to generate employment for those persons who want to work but are not doing so, even though they are available for employment and actively seeking work. It is thus seen as

an indicator of the efficiency and effectiveness of an economy to absorb its labor force and of the performance of the labor market (UNdata, 2021).

The UNEMP rate was high in both analyzed countries during the disintegration period from the ex-Yugoslavia and setting its independence. One of the reasons for the higher UNEMP rate may be subsidies for unemployed persons as was a case in Slovenia (Vodopivec, 1995). Adequate social safety nets can be an important factor in ensuring the sustainability of reforms in transition economies. However, when unemployment insurance is too generous, there is a danger that it may create perverse incentives to take a job.

Since the very beginning of the process of EU integration, the gradual introduction of free movement of labor had been considered instrumental in promoting economic development and peaceful intra-state relations among Western European countries (Bernard, 2019). On the other hand, there are many of ex-Yugoslavian problems that need to be stressed (Legiedz, 2019). The first is extremely widespread unemployment, as the Balkan countries have the highest UNEMP rates in Europe (Uvalic, 2011). Montenegrin UNEMP rate rise in 1991 up to 50% according to the 1990 rate, and in Slovenia over 15%. Although a significant part of the labor force in all Balkan countries has an activity in the informal economy, the dimension of unemployment in the region has been alarming (Mikulic and Galic, 2013).

The OECD (2021) defines GDP as an aggregate measure of production equal to the sum of the gross values added of all resident and institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). In the research, we would like to present how two countries perform by GDP per capita and UNEMP rate during 29 years. Hall (2002) pointed out: "pre-1989 Yugoslavia appeared to have developed a successful industry which projected a particularly welcoming and positive image of the country to the West. The emergent newly independent states had to put their Yugoslav and communist pasts behind them, establish a new national identity (albeit based on historical elements) and inspire confidence for investment in economic reconstruction." This paper examines the cases of Slovenia and Montenegro, which are looking to economic revitalization, a higher level of economic development and a flexible labor market.

The transition to a market economy in the Balkan region started in 1989-90, with the first multiparty elections and big-bang economic reforms launched by the last Yugoslav government of A. Markovic (Bojnec, 1996). However, the process was interrupted by the disintegration of Yugoslavia in June 1991, which was accompanied by a very severe political crisis and continuous economic instability (Uvalic, 1993).

S. Bernard (2019) expose that Yugoslav regional disparities placed the Yugoslav federation and each of its republics in different position vis-à-vis the poorest countries in Western Europe. For example, in 1990, GDP per capita in ex-Yugoslavia was 3,764 US dollars, in Slovenia 9,829 US dollars and Montenegro 3,491 US dollars. This difference in the level of economic development between republics was one of the reasons why Yugoslavia was described in European Economic Community (EEC) parliamentary discussions about the future of EEC-Yugoslav relations as half a developed [referring to Slovenia and Croatia] and half a developing country [all the other republics]. This duality of ex-Yugoslav economic development helps explain why in the same discussions it was stressed that cooperation agreements with the EEC should grant better conditions of trade and fairer distribution of products within the EEC market to the well-developed industries of Slovenia (Bernard, 2019).

The borderless Single European Market (SEM) of EU gives opportunities for suppliers on enlarged markets, thus making better use of the economies of scale, as well as allowing consumers a wide choice of products under supply-side pressures on maintaining market competitiveness. In terms of integration into world trade, Slovenia and Montenegro are small-open economies and are highly dependent on international trade (Bojnec, 1996; Karadzic and Backovic, 2021).

Slovenia has an excellent geographical position, since it is surrounded by highly developed countries in the north and west, and in addition, Slovenia has an economic environment with quality infrastructure, particularly roads (Bernard, 2019). On the other hands, Montenegro is surrounded by economically and politically fewer stable countries which are looking for integration with the EU such as Albania, Bosnia and Herzegovina, Serbia and Kosovo. The need to create a more integrated regional economic area in

Western Balkan countries as a learning ground for the region to make further progress along its path to deeper EU integration is important. With the entry into the EU, Slovenia since 2004 has gained free entry into the borderless SEM, which for many companies has meant driving force for an increase in production and export sales due to increased demand. Consequently, the increase in production creates new jobs and potentially decreased UNEMP.

Regarding previous empirical researches, academic attention to the history of ex-Yugoslavia and theoretical considerations we can derive our hypothesis. The null hypothesis ( $H_0$ ) is: Unemployment rate does not cause GDP per capita, and vice versa or there is no statistically significant causality relationship. The opposite alternative hypothesis ( $H_1$ ) is: Unemployment rate causes GDP per capita, and vice versa. In this case, Okun`s law exists, because job creation reduces the UNEMP rate and generates growth in GDP per capita (Bartolucci et al., 2018).

## 2. METHODS AND DATA

In the research, three methods are applied: first, descriptive statistics with analyses of minimum, maximum, standard deviation and mean value. Second, we apply ordinary least square (OLS) regression analyses. Finally, the spurious results with a high deterministic coefficient and significance of the model suggest further analyses with the Granger Causality test.

**Table 1.** Introduction of variables

Abbreviation of variable	Variable	Sources	
		Slovenia	Montenegro
$GDP\ per\ capita_t$	Gross domestic product	UNdata: 1990 - 2018	UNdata: 1990 - 2018
$UNEMP_t$	Un-employment	UNdata: 1990 ILO: 1991 - 2018	MONSTAT: 1990 ILO: 1991 - 2018

Source: UNdata (2021); MONSTAT (2020); ILO (2021).

Although we also need to test restrictions on the  $\zeta$  matrix to test for weak exogeneity in the I (1) model, the test for a zero row in the  $\alpha$  matrix may provide some preliminary information on which variables that may be weakly exogenous. Data sources for GDP per capita and UNEMP rate are taken from, the United Nations (UNdata, 2021), the International Labor Organisation, (ILO, 2021) and the Statistical Office of Montenegro (MONSTAT) (MONSTAT, 2020) (Table 1). This data is used with an econometric approach and is further calculated from chain indices to indices with a constant base. The data is compiled for two countries and analyzed data is shown separately from 1990 onwards.

Data for GDP per capita for the 29 years is presented in Table 2 and consists of various sources and data ranges. Therefore, indices with the constant base (1990=100) are applied. The data is obtained as yearly GDP per capita from the United Nations Statistics Division (UNSD). First, GDP per capita is on a yearly data basis for both countries for the period 1990-2017 (Table 1). Second, we conduct contemporary GDP per capita as yearly data and not quarterly data.

The data for the UNEMP rate is obtained from ILO (2019) for the period 1991-2018. The data for 1990 for Montenegro is from the MONSTAT and for Slovenia is from the UNdata source.

The UNEMP rate is calculated by expressing the number of unemployed persons as a percentage of the total number of persons in the labor force. The labor force (formerly known as the economically active population) is the sum of the number of persons employed and the number of persons unemployed.

### 3. EMPIRICAL RESULTS AND DISCUSSION

From the collected data for both variables and both countries, we strive new data vector, which consists of years from 1990 to 2018. The data vector can be written as:

$${}^{MNE}_{SI}[GDP\ per\ capita\ UNEMP]_t^I, \quad (1)$$

where *MNE* is an abbreviation for Montenegro, *SI* for Slovenia, *t* for time series, *I* order of integration, *UNEMP* unemployment rate and *GDP* per capita. As the base year is 1990=100.

In Figure 1 we can see that GDP per capita in Slovenia exploded in 1995 and hereinafter. On the other hands, GDP per capita in Montenegro has explosive roots in 2000 and onwards. In Figure 2 the UNEMP rate decreases in both countries but at different values and years. Slovenia has gained benefits on the SEM of the EU since 2005. In Montenegro, the independent since 2006, it has created an environment for more employed persons.

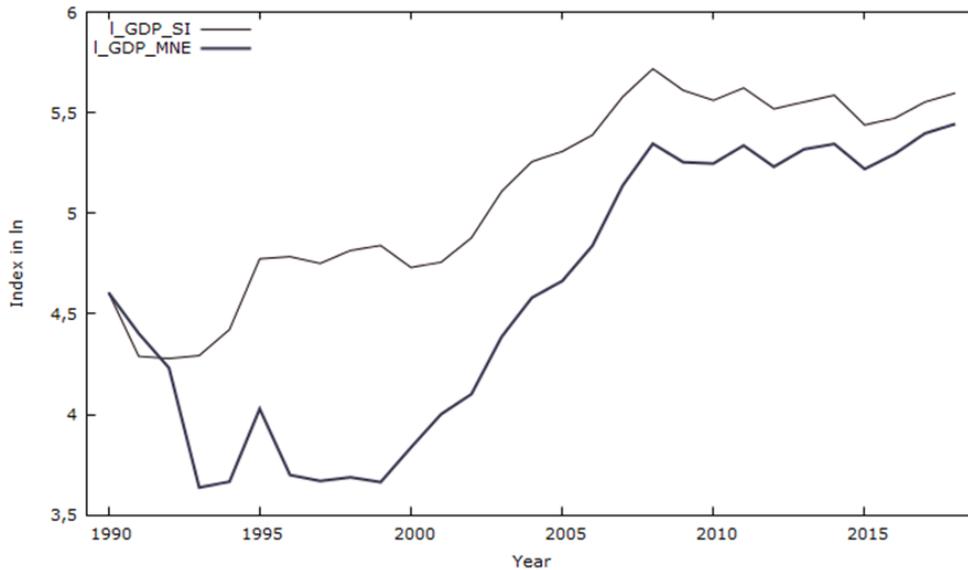
**Table 2.** Indices with constant base\* and results of descriptive statistics

Year \ Variable	$GDP\ per\ capita_t^{MNE}$	$GDP\ per\ capita_t^{SI}$	$UNEMP_t^{MNE}$	$UNEMP_t^{SI}$
1990	100.00	100.00	100.00	100.00
1991	81.61	72.85	118.64	148.89
1992	68.75	72.08	120.34	162.22
1993	37.95	73.11	125.42	177.78
1994	39.07	83.21	125.42	162.22
1995	56.09	118.31	127.12	148.89
1996	40.39	119.59	125.42	144.44
1997	39.22	115.61	127.12	142.22
1998	39.93	123.26	127.12	162.22
1999	38.99	126.39	127.12	157.78
2000	46.29	113.31	127.12	146.67
2001	54.65	116.28	127.12	122.22
2002	60.36	131.25	128.81	128.89
2003	80.26	165.38	130.51	137.78
2004	97.48	191.70	128.81	135.56
2005	105.90	201.64	128.81	146.67
2006	126.18	218.79	105.08	135.56
2007	170.18	264.64	81.36	111.11
2008	209.62	304.12	72.88	100.00
2009	191.26	273.39	81.36	135.56
2010	189.92	260.02	83.05	166.67
2011	207.85	276.64	83.05	184.44
2012	186.94	249.16	84.75	200.00
2013	203.92	257.92	84.75	228.89
2014	209.37	266.82	77.97	220.00
2015	184.82	230.08	77.97	202.22
2016	199.31	237.94	77.97	177.78
2017	221.68	258.01	71.19	151.11
2018	251.27	288.69	67.80	124.44
Maximum	251.27	304.12	130.51	228.89
Minimum	37.96	72.08	67.80	100.00
Mean	121.32	182.45	104.97	153.87
Median	100.00	191.70	118.64	148.89
St. deviation	71.71	77.10	23.63	32.02
Skewness	0.18	-0.02	-0.25	0.55
Kurtosis	-1.66	-1.58	-1.73	-0.00

Note: GDP – gross domestic product, UNEMP – unemployment, \* (base year 1990 = 100)

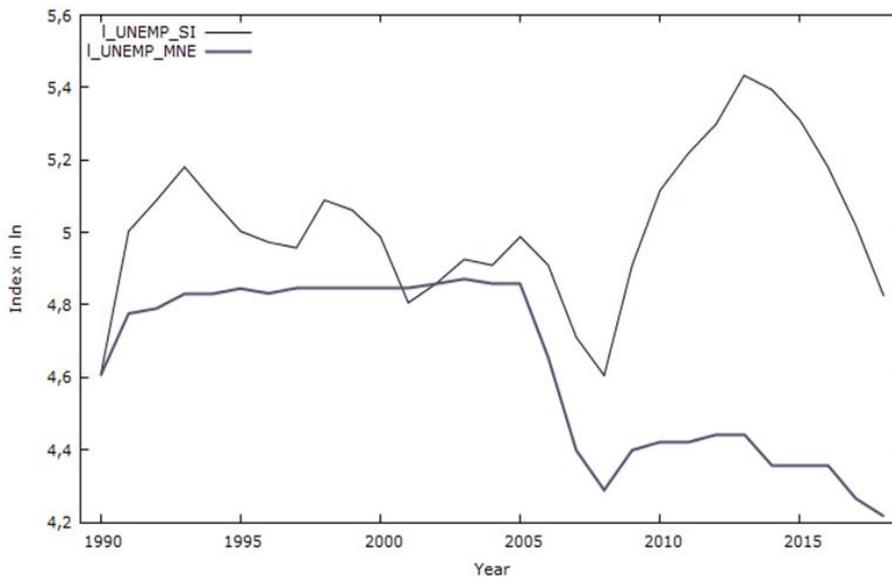
Source: Authors complications from the data vector.

In the initial stage, both analyzed countries suffer from the Yugoslav disintegration. In 1991, GDP per capita in Slovenia dropped by almost 30%. From Figure 3 and Table 3 can be also seen that in the period 1995-1999, Montenegro experienced a rapid downwards of GDP per capita. Since its independence in 2006, the Montenegrin economy has recovered. In 2018, the UNEMP rate index was 67.8 (the base year 1990=100). In the same year 2018, according to ILO (2021) in Montenegro was 40.000 persons unemployed or 15.5% of labor force. Between 1990 and 2008, Montenegro doubled GDP per capita. The economic crises started in 2008 and experienced a triple “V-shape” crisis with a minimum in 2015. Since then, GDP per capita has experienced a recovery period. In 2018, the GDP per capita index was 130% (the base year 1990=100).



**Figure 1.** Indices of GDP per capita for Slovenia and Montenegro, 1990-2018, indices with constant base year 1990=100

Source: Authors' compilations from the data vector.



**Figure 2.** Indices of UNEMP rate for Slovenia and Montenegro, 1990-2018, indices with constant base year 1990=100

Source: Authors' compilations from the data vector.

On the other hand, in the early 1990s, Slovenia experienced a drop in GDP per capita with later recovery, which has been further strengthened with the EU integration process. Slovenia started negotiation with the EU in 1998 and entered the EU in 2004. In 2004 and 2007, GDP per capita doubled, and in 2008 tripled in comparison to 1990. In 2007, Slovenia introduced the euro but later suffered an economic crisis. The triple “V-shape” crisis and its minimum were reached in 2015 when the UNEMP rate exactly doubled to that in 1990 as well as in 2008. The Slovenian UNEMP rate has declined. In 2018, it was 5.5% of labor force (ILO, 2019).

In the succeeding is to conduct OLS regression analysis. It is important to note that this method is only used to see the associations between the variables, but not to discuss the results, since the results could be spurious (Juselius, 2021) and Durbin–Watson statistic is low. Therefore, the equation of regression analysis is:

$$Y_t = \alpha + \beta_t \cdot X_t + \epsilon, \text{ and} \quad (2)$$

empirical results for Montenegro are:

$$GDP \text{ per capita}_t = 207.84 + 1.22 \cdot UNEMP_t + \epsilon, \quad (3)$$

$$UNEMP_t = 159.07 + 0.08 \cdot GDP \text{ per capita}_t + \epsilon, \quad (4)$$

where it is worth emphasizing that beta coefficients are not statistically significant. The regressions result for Slovenia are:

$$GDP \text{ per capita}_t = 627.05 + 4.27 \cdot UNEMP_t + \epsilon, \quad (5)$$

$$UNEMP_t = -111.00 + 0.01 \cdot GDP \text{ per capita}_t + \epsilon, \quad (6)$$

and beta coefficients are also not statistically significant. Therefore, it is important to employ the Granger Causality test (Table 4).

**Table 3.** Important brakes in time-series, indices with constant base year 1990=100

Variable	Montenegro					
Structural break	1991 – the disintegration of ex-Yugoslavia	1999 – euro as de facto currency	2006 – became independent	2008 – economic crisis	2015 – a crisis of triple V-shape	2018 – recovery period
<i>GDP per capita<sub>t</sub></i>	81.61	38.99	126.18	209.62	184.82	251.27
<i>UNEMP<sub>t</sub></i>	118.64	127.12	105.08	72.88	77.97	67.80
Variable	Slovenia					
Structural break	1991 – the disintegration of Yugoslavia	2004 – the entry in the EU	2007 – euro as a national currency	2008 – economic crisis	2015 – a crisis of triple V-shape	2018 – recovery period
<i>GDP per capita<sub>t</sub></i>	72.85	191.70	264.64	304.12	230.08	288.69
<i>UNEMP<sub>t</sub></i>	148.89	135.56	111.11	100.00	200.00	124.44

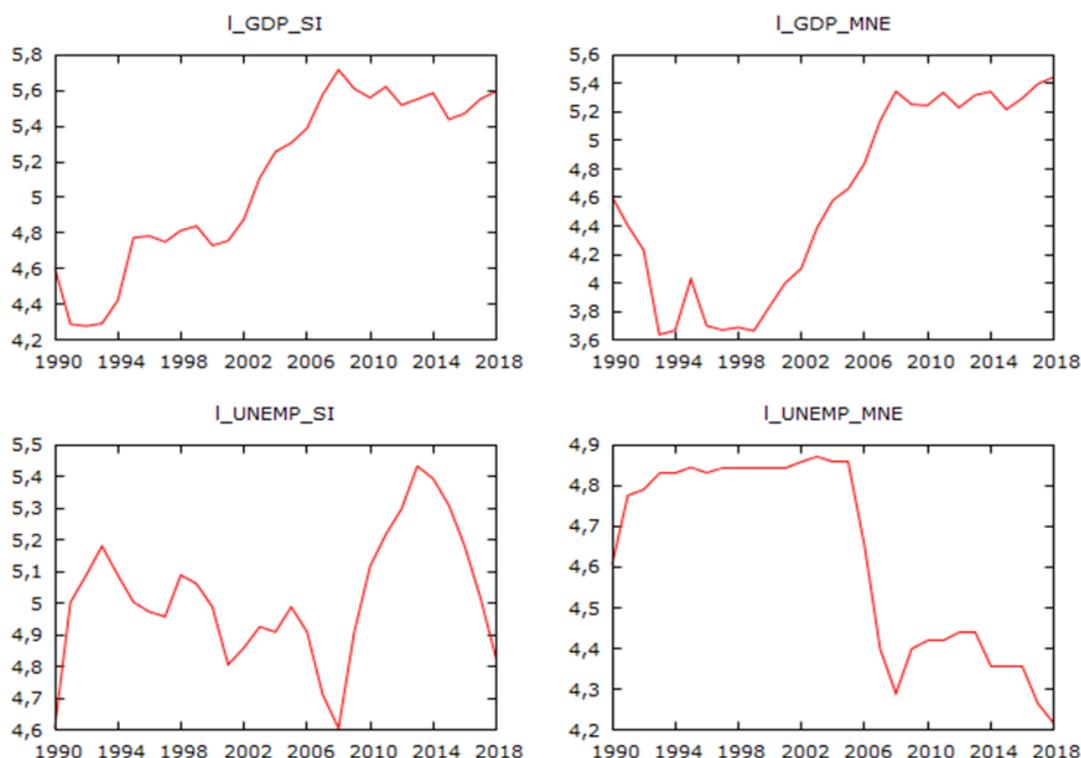
Source: Authors compilations from the data vector.

With the raised hypothesis  $H_0$  if there exists a causal relationship between UNEMP rate and GDP per capita and the opposite hypothesis  $H_1$  that there is not valid causality, the results from Table 4 could be evaluated and discussed. The results are presented separately for Slovenia and Montenegro. During these 29 years long period, these countries have experienced several policies, economic and monetary breaks, which occurred during the ex-Yugoslavia (1990/91), and later since independence within Slovenia and Montenegro (latter initially together with Serbia). More specifically, two analyzed countries during the analyzed period went through three institutional environments where Slovenia went through the ex-

Yugoslavia, independent Slovenia, and recently in the enlarged EU; Montenegro went through the ex-Yugoslavia, constitution of Serbia and Montenegro, and independent Montenegro.

On top of that, both countries had three monetary regimes as the Yugoslav dinar until 1991, then Slovenia introduced the Slovenian tolar up to 2006, and Montenegro German marks up to 1999. Both countries introduced the euro: Slovenia as a national currency in 2007 and Montenegro as de facto currency in 1999 (Table 3).

In addition, in the analyzed period, there were at least three economic crises: in 1991, split of the ex-Yugoslavia and its disintegration. In 2008, the global economic crisis occurs with a triple “V-shape” in 2008, 2012 and 2015 for Slovenia; and 2010, 2012 and 2015 for Montenegro. However, the main crisis was in the early 1990s with the collapse of ex-Yugoslavia with a rapid decline of GDP per capita in all republics of ex-Yugoslavia. These structural breaks for Montenegro and Slovenia are depicted in Figure 3.



**Figure 3.** Structural breaks in variables

Source: Authors compilations from the data vector.

Therefore, the long-run analysis imposes all these restrictions (structural breaks) on beta, and in implemented Granger Causality test is a vigorous method to be employed. Table 4 presents the results of the Granger Causality test between *GDP per capita* and *UNEMP* rate for Slovenia and Montenegro during the period 1990-2018. The results of the *F* test using two lags confirm only one statistically significant relationship for the null hypothesis  $H_0$  that  $UNEMP_t$  rate does not (Granger) cause  $GDP\ per\ capita_t$ , and vice versa.

The results show that labor market in Montenegro has had a significant impact on GDP per capita, but not vice versa in the long-run period of 29 years. On the other hand, there is no causal relationship found for Slovenia.

**Table 4.** Granger Causality test

<i>Direction of causality</i>	<i>Number of lags</i>	<i>F value</i>	<i>Decision</i>
$GDP\ per\ capita_t^{MNE} \rightarrow UNEMP_t^{MNE}$	1	0.31	Cannot be rejected
$UNEMP_t^{MNE} \rightarrow GDP\ per\ capita_t^{MNE}$	1	2.37*	Rejected
$GDP\ per\ capita_t^{SI} \rightarrow UNEMP_t^{SI}$	1	0.04	Cannot be rejected
$UNEMP_t^{SI} \rightarrow GDP\ per\ capita_t^{SI}$	1	0.86	Cannot be rejected

Note: GDP – gross domestic product, UNEMP – unemployment, \* 10% significance level.

Source: Authors compilations from the data vector.

Following Maddison (2003), the basic methodology involves convene time-series of GDP per capita for each country and projecting forwards from a 1990 benchmark. Moreover, Broadberry and Klein (2008) confirm the dramatic collapse of economic activity in Central and Eastern Europe (CEE) combined with respectable growth in North-Western and Southern Europe to produce a substantial divergence of living standards during the 1990s. Given the large weight of CEE economies in the continent as a whole, and combined with an acceleration in US growth during the second half of the 1990s, Europe's GDP per capita declined from 47.2% of the US level in 1990 to 42.5% by 2000. Our results and finding for Slovenia and Montenegro are consistent with Broadberry and Klein (2008). Montenegrin GDP per capita declined between 1990 and 2000, while Slovenian rise, except for the period 1990-1994, when declined by almost 30% during the first years of the collapse of ex-Yugoslavia. On the other hand, Montenegrin GDP per capita declined up to 2004. In 1993, it was at the lowest level; 70% less than in 1990.

The empirical model contributes to the discussion on causality between labor market, economic growth and level of economic development. The previous theoretical works have largely based on the theory of economic growth (Bluescke et al., 2019). The augmented human capital models have been applied to analyze the effects of employment on growth as an important goal of macroeconomic policy. The ideal paths imply smooth economic growth and its impact on job creation and reduction in the rates of unemployment.

Some theoretical works discuss Okun`s law (Dixon et al., 2016), including for Slovenia (Bartolucci et al., 2018), and Montenegro (Karadzic and Backovic, 2021). The confirmed Okun`s law is important for economic policy: an increase in economic growth can not only have the desired outcome on reducing the overall unemployment rate, but it can also have the distributional effect on lowering youth unemployment (Dixon et al., 2016; Južnik Rotar, 2018).

A rare single measure of labor-market performance receives more attention among academics and policymakers than the unemployment rate. It is well known, for example, that average unemployment rates are higher in Western Europe than in the US and Japan. But there is little systematic evidence about how average unemployment rates vary across the entire world of the income distribution. Internationally comparable data from the emerging market economies are particularly lacking. This lack of data hampers research on the determinants of national average unemployment levels, and the link between unemployment and economic development (Feng et al., 2018). The issue of how a country can achieve economic growth is one of the fundamental economic questions.

The causalities between per capita GDP and unemployment rate are investigated for Montenegro and Slovenia. To sum up, the hypothesis using the Granger Causality test and not OLS could be confirmed only in a relationship for Montenegro  $UNEMP_t^{MNE} \rightarrow GDP\ per\ capita_t^{MNE}$ , where UNEMP causes GDP per capita.

This striking finding can be also an argument for the speedy integration process of Montenegro into the EU at the time of Brexit, which can have negative implications for per capita GDP in the UK (Becker, 2017). Regarding Solilova et al. (2019) if relocation of financial terms is taken into account the negative scenario could turn into a positive effect. For example, based on historical time-series data, Slovenia has suffered declining GDP per capita for five years, while Montenegro for nine years. Moreover, the scenario that the UNEMP rate is increasing with GDP per capita is consistent with Feng et al. (2018).

## CONCLUSION

Already the constructed long-term time-series secondary data from 1990 to 2018 for Montenegro and Slovenia is an important scientific step. The specific contribution is applied Granger Causality test for two concurrence countries that share common the ex-Yugoslav history in the Western Balkan region. Both countries have introduced the euro, Slovenia as national currency and Montenegro as de-facto currency. Since 2004 Slovenia is part of the EU, and Montenegro got acceptance for negotiations with the EU, started on 29 June 2012.

The results of this research show the hypothetic importance of the integration process for Slovenia. Since 2004, Slovenia has benefited from EU integration, which can be also linked to an increase in GDP per capita and a decline in the unemployment rate.

There are policy and economic implications of this research for Montenegrin and Slovenian economies. Both countries could recognize a stronger partnership, which makes bilateral and multilateral freedom of movements of goods and services. These policy events could raise GDP per capita even more than it has happened in recent years following the structural breaks in time-series of disintegration on traditional ex-Yugoslav markets, political and economic crises since the 1990s. The significant negative structural break for Slovenia in the researched period was identified for the years 1991-1992 when GDP per capita declined rapidly. At the same time, the UNEMP rate sharply increased. On the other hand, similar shocks could be identified for Montenegro for an even longer period. The significant decline in GDP per capita and increase in UNEMP rate was for the years 1991-2006. In the 1990s, this was the time of disintegration from traditional ex-Yugoslav markets and in the case of Slovenia, trade reorientation towards western markets (Bojnec, 1996).

Among limitations of the research, this is data limitation to study additional years, e.g. before 1990. Finally, cointegrated vector autoregression modelling can be applied.

## REFERENCES

- Bartolucci, F., Choudhry, M.T., Marelli, E., Signorelli, M. (2018), "GDP dynamics and unemployment changes in developed and developing countries", *Applied Economics*, Vol. 50, No. 31, pp. 3338-3356.
- Bebler, A. (1993), "Yugoslavia's variety of communist federalism and her demise", *Communist and Post-Communist Studies*, Vol. 26, No. 1, pp. 72-86.
- Becker, J. (2017), "In the Yugoslav Mirror: The EU Disintegration Crisis", *Globalizations*, Vol. 14, No. 6, pp. 840-850.
- Bernard, S. (2019), "Oil shocks, migration and European integration: a (Trans)national perspective on the Yugoslav crises of the 1980s", *National Identities*, Vol. 21, No. 5, pp. 463-484.
- Bojnec, S. (1996), "Macroeconomic stabilization and the reform process in Slovenia", *Eastern European Economics*, Vol. 34, No. 1, pp. 21-40.
- Boubtaneab, E., Coulibaly, D., Rault, C. (2013), "Immigration, unemployment and GDP in the host country: Bootstrap panel Granger causality analysis on OECD countries", *Economic Modelling*, Vol. 33, No. 7, pp. 261-269.
- Broadberry, S., Klein, A. (2008), "Aggregate and per capita GDP in Europe, 1870-2000: Continental, regional and national data with changing boundaries", *Scandinavian Economic History Review*, Vol. 60, No. 1, pp. 79-107.
- Dixon, R., Lim G.C., van Ours, V.C. (2016), "Revisiting the Okun relationship", *Applied Economics*, Vol. 49, No. 28, pp. 2749-2765.
- Feng, Y., Lagakos, D., Rauch, J. (2018), "Unemployment and Development", *2018 Meeting Papers 289, Society for Economic Dynamics*.
- Froyen, T.R. (2012), *Macroeconomics: Theories and policies*, Pearson Prentice Hall, Upper Saddle River.
- Hall, D. (2002), "Brand development, tourism and national identity: The re-imaging of former Yugoslavia", *Journal of Brand Management*, Vol. 9, No. 4, pp. 323-334.
- Juselius, K. (2021), Searching for a theory that fits the data: a personal research odyssey. *Econometrics*, Vol. 5, No. 3, pp. 1-20.

- Juznik Rotar, L. (2018), "What are the Treatment effects of a work-first participation programme on young unemployed people in the Netherlands?", *Panoeconomicus*, Vol. 66, No. 2, pp. 203-217.
- Karadzic, V., Backovic, T. (2021), „Relevance of Okun’s Law in Montenegro”, *Montenegrin Journal of Economics*, Vol. 17, No. 1, pp. 59-69.
- Legiedz, T. (2019), "The transition from limited access orders to open access orders in the post-communist Europe", *Communist and Post-Communist Studies*, Vol. 52, No. 3, pp. 187-195.
- Maddison, A. (2003), *The World economy: historical statistics*. Organisation for Economic Co-operation and Development, Paris.
- Mihailovic, K. (1963), "The regional aspect of economic development", *Eastern European Economics*, Vol. 2, No. 1-2, pp. 29-45.
- Mikulic, D., Galic, N.A. (2013), "Causes of the unofficial economy in new EU member states", *Economic Research*, Vol. 26, No. 1, pp. 29-44.
- MONSTAT (2020), *Metadatesi*, <http://monstat.org/cg/page.php?id=17&pageid=17>, (accessed in August 2020) - in Serbian.
- OECD (2021), *Gross domestic product (GDP)* (indicator), <https://data.oecd.org/gdp/gross-domestic-product-gdp.htm>, (accessed in May 2021).
- Pavlovic, D. (2019), "Prospect theory and presidential elections: Two cases from Yugoslavia and Serbia", *Communist and Post-Communist Studies*, Vol. 52, No. 1, pp. 11-24.
- Solilova, V., Nerudova, D., Litzman, M. (2019), "Financial transaction tax: The Brexit - an opportunity or threat?", *Journal of Economics*, Vol. 67, No. 3, pp. 223-244.
- UNdata (2021). United Nations Statistics Division, <http://data.un.org/Data.aspx?q=gdp+per+capita+yugoslavia&d=SNAAMA&f=grID:101;currID:USD;pcFlag:1;crID:890> (accessed in May 2021).
- Uvalic, M. (1993), "The disintegration of Yugoslavia: Its costs and benefits", *Communist Economies and Economic Transformation*, Vol. 5, No. 3, pp. 273-293.
- Vodopivec, M. (1995), *Unemployment insurance and duration of unemployment*, World Bank, Washington, DC.

