ECONOMIC PERFORMANCE OF THE COUNTRIES IN THE WESTERN BALKANS

Gëzim Tosuni *, Shkumbin Misini **

* Faculty of Economics, University "Kadri Zeka", Gjilan, Republic of Kosovo
** *Corresponding author*, Faculty of Economics, AAB College, Prishtina, Republic of Kosovo
Contact details: Faculty of Economics, AAB College, St. Elez Berisha, No. 56 Fushë Kosovë Industrial Zone, 10000 Prishtina, Republic of Kosovo

How to cite this paper: Tosuni, G., & Misini, S. (2023). Economic performance of the countries in the Western Balkans. *Journal of Governance & Regulation, 12*(4), 8–21. https://doi.org/10.22495/jgrv12i4art1

ISSN Online: 2306-6784
ISSN Print: 2220-9352

Received: 19.01.2023
Accepted: 03.10.2023

JEL Classification: E24, E29, E31, H60, P47
DOI: 10.22495/jgrv12i4art1

Abstract

This paper will analyse the economic performance of six Western Balkan countries. Macroeconomic indicators have differences from country to country due to the government policies they have (Aryani et al., 2023). The economic performance of countries depends on global influences and the development model of some governments on how they use their country's natural resources (Chutipat et al., 2023). The aim is to measure the economic performance index (EPI) for each country in this region. The paper methodology will have secondary data for the years 2010–2020. The EPI finding is constructed using the following indicators: unemployment, inflation, budget deficit, and economic growth. To do this, graphs, descriptive statistics, and regression models were used. In conclusion, based on conventional wisdom, the results show that countries that have performed better have shown increases in average private sector monthly wages and vice versa. Contrary to expectations, a larger population appears to have a negative impact on performance, and country specifics do not appear to be statistically associated with better performance. Thus, the importance of this paper is to add to the emerging literature by arguing for the superiority of the EPI compared to more traditional indicators.

Keywords: Economic Performance Index, EPI, Population, Average Monthly Wages, Exchange Rates, Inflation, Unemployment, Public Debt, Economic Growth

Authors' individual contribution: Conceptualization — G.T. and S.M.; Methodology — G.T. and S.M.; Formal Analysis — G.T.; Investigation — S.M.; Data Curation — G.T. and S.M.; Writing — Original Draft — G.T. and S.M.; Writing — Review & Editing — G.T. and S.M.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

The concept of growth sometimes is viewed by economists as a monochromatic white or black outcome. But this approach cannot be further from the truth. There are no uniform formulae that ensure economic growth, and there is a myriad of ways to measure the said growth. Some resolve to interpret statistical indicators showing no regard for whether this growth has had any impact on the well-being of the people or has helped in reducing unemployment. Seen from this perspective, it can be deduced that nowadays academics are more preoccupied with the methodology rather than the essence, as many countries report economic growth, but fail to show the reduction of unemployment or any improvement in the standard of living (Sedlacek, 2011; Misini & Mustafa, 2022; Misini & Badivuku, 2016; Kirova, 2020). Also, the main purpose is to highlight the economic performance of the Western Balkan countries because, with an empirical model, we do not have any such work, this paper will present the economic performance of the Western Balkan countries.

The main motivation for the regional focus of this study stems from the fact that all the countries in the dataset shared a similar history during the end of the previous century, not to mention that except for Albania, the other five countries used to live in the same federal state till 1990s. This means that there are reasons to study them jointly and attempt to find out their individual traits in functioning as individual entities. Furthermore, the intention is to provide policymakers with a fresh perspective on the economic performance of the countries, hoping that this information will be utilised in drawing new policies to advance their respective well-being. This paper will look at the six Western Balkan countries: Albania, Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Kosovo, commonly referred to as the Western Balkan 6 (WB6). WB6 countries have displayed a constant growth of the gross domestic product (GDP) in the past years, but still face a number of macroeconomic challenges such as high unemployment, high public debt, etc. Given that there is an agreement that GDP is not the most appropriate index of economic prosperity, this study turns to another indicator. Also, these Western Balkan countries have economic growth every year, and policymakers brag about the economic growth of these countries, but the paper will measure the economic performance of these countries in the most realistic possible way, using the most relevant macroeconomics indicators in an empirical model for measurement for every country in the Western Balkans.

The economic performance index (EPI) is a complex macroeconomic indicator that should alleviate some of the shortcomings that simple indices such as GDP, display. This indicator was developed by the International Monetary Fund (IMF) in 2013 and it combines inputs from 1) inflation — a monetary indicator, 2) unemployment — a production indicator, 3) GDP budgetary deficit — a fiscal measure, and 4) the change of real GDP — an aggregate performance measure for the economy. Further, the indicators that have the most impact on economic performance will be analysed, but in this paper, we will measure and analyse indicators such as unemployment, public debt, inflation, and economic growth.

Using the conventional indicators for 2021 it can be seen that the WB6 countries' economies have had a faster recuperation from the recession caused due to the COVID-19 pandemic[1]. The average GDP growth for 2021 for the WB6 countries, according to The World Bank (2022) is 8.5%, which follows a contraction of 3.1% in 2020. The growth trend forecasts an increase of 4.1% in 2022 and 3.8% in 2023. This growth can be attributed to a list of factors, internal and external, that have created favourable conditions for exports. The reduction of inflation rates meant that economies could relax their anti-COVID-19 measures, which enabled the release of the 'accumulated' funds within households and firms during lockdowns. Suddenly, people were able to travel, so tourism was generating a lot of income as well as affecting positively the demand and increased consumption. This was helped also with the recovery packages put in place by each country as a response to the pandemic[2]. Empirical methods were used in the paper, based on the dependent variable EPI, and the independent variables mentioned above. The data are secondary and were obtained from The World Bank, the IMF, as well as from the agencies of the competent institutions of these countries.

However, despite the economic growth, the region remains fragile as high unemployment persists. This was exacerbated by the loss of jobs during the pandemic mostly affected women and the young population, which can hamper efforts to increase the very low workforce participation indicator in the region (The World Bank, 2021). As a consequence, Western Balkan countries are faced with high emigration and, a drop in natality figures which translates into a decrease in the economic performance of these economies. Thus, according to this paper's analysis, the constant increase of the GDP in WB6 did not translate into the increase of EPI. In this paper, we conclude that the most important indicator that has influenced economic performance has been the state with the lowest unemployment, which has resulted in the best economic performance.

As such, the contribution of this paper is to add to the emerging strand of literature arguing for the superiority of EPI compared to more traditional indicators used to explain the overall state of economies.

The structure of the paper is as follows. Section 2 reviews the relevant literature. Section 3 provides the methodology that was used to conduct the empirical research. Section 4 analyses the economic performance of the Western Balkan countries. Section 5 investigates the macroeconomic indicators of the countries. Section 6 discusses the empirical analyses. Section 7 presents the results of the paper. Section 8 discusses the main findings by analysing their relevance in the theoretical aspect. Section 9 concludes the paper.

2. LITERATURE REVIEW

Literature shows different approaches to estimating the macroeconomic performance of an economy, and some of these studies fail to acknowledge the impact that economic growth has on unemployment, inflation, public debt, and other macroeconomic aspects. This is often due to a lack of available data but every once in a while, one encounters authors who emphasise positive macroeconomic indicators and ignore the negative ones hence ignoring the systemic effects those may cause.

Most countries, developed and underdeveloped or in transition, base their economic performance on the theory of gross national product (GNP) in the framework of measuring GDP parameters (economy, investments, government spending, net export). The boast of institutional theories depends on how much GDP growth is, which is measured in certain periods of time and compared between years. However, we have many countries that have

[1] Authors are aware that at this point it is early to evaluate real effects of COVID-19.

[2] Authors acknowledge the shortcoming of this study with respect to COVID-19 and that more time is needed to find out the real effects of COVID-19 on economies, hence the interpretations in this paper related to COVID-19 should be viewed more as intuitive and less as supported by empiric findings.

high economic growth in terms of GDP measurement, but we have no results in raising the standard of living for those citizens. This paper will analyse some very important macroeconomic indicators of the Western Balkans countries in order to more precisely measure their economic performance. The indicators that will be used to measure the economic performance of these countries are not the same indicators that are measured within GDP. Also, we will present an overview of the theories of measuring the economic performance of states which are based on the measurement of GDP. However, through these indicators: inflation, unemployment, public debt, and economic growth, which will be analysed for the period our dataset allows, the performance of Western Balkans' countries will be measured using the indicator introduced by IMF in 2013.

It is to be expected, given that countries are comprised of a multitude of agents, and thus interests, that there are more ways to present the economic performance of a country. Some think that rather than instead of traditional macroeconomic indicators, a better indicator can be the well-being of the public. But this also comes with its problems, since as Cook and Kenny's (2005) study reports there is a difference in the perception of subjective well-being and economic development. This brings a strand of authors discussing the GDP per capita as a more appropriate macroeconomic indicator. Despite some shortfalls in reflecting the inequalities in income distribution, GDP per capita is superior to GDP in reflecting the overall development of the economy (Georgescu, 2016; Motofei, 2017). This is in line with Dynan and Sheiner (2018) who find that the benefits of the growth of the GDP are rather enjoyed by few individuals, and more attention should be paid to the metrics of GDP per capita which may capture better the well-being of the public and the overall performance of the economy.

When discussing macroeconomic indicators, Elmendof and Mankiw (1999) find that public debt can positively impact the aggregate demand thus helping in short-term growth, but in the long term, public debt adversely affects growth. High public debt can hamper investment (Modigliani, 1961; Gale & Orszag, 2002; Baldacci & Kumar, 2010). Deterioration of the public debt is detrimental to economic growth, even though it in some cases helps in raising public capital (Adam & Bevan, 2005; Saint-Paul, 1992; Aizenman et al., 2007). The period 1973–1978 brought high inflation and unemployment that had influenced the poor economic performance of the Organisation for Economic Co-operation and Development (OECD) countries (Mohan, 2015).

In general, public debt is perceived to incentivise skewed taxation or higher inflation in order to pay for the debt, which in turn reduces the potential growth in the future. Thus, public debt restricts the scope of fiscal policy instruments for the government (Aghion & Kharroubi, 2008; Woo, 2009). The level of how indebted European Union (EU) countries have gotten seems to vary from 0.9% to 86.9% for the period 2009 to 2014 (Mihaylova-Borisova & Nenkova, 2021). Obeidat et al. (2022) analysed data for the period 1992–2019 using empirical analysis resulting in a long-run relationship between real fiscal deficit and real GDP. Reinhar and Rogoff (2010) examining the relationship between inflation, debt, and growth, find a non-linear relationship between public debt and growth. Their analysis suggests that for developed countries, lower debt, all else equal translates into higher growth proportionally. This relationship, according to authors, holds also for emerging markets, albeit at a lower intensity.

The non-linearity in the relationship between growth and debt is confirmed also by Checherita-Westphal and Rother (2012). Observing a group of countries from the Balkans, an inverted relationship between public debt and development is identified, with the inflection point for this specific group being 55.5% of GDP (Gashi, 2020). Looking at OECD countries for the period 1960–1992, Andrés and Hernando (1997) found a significant negative correlation between inflation and income, which they interpret as moderate inflation rates affect adversely growth, thus reducing income per capita. Their data seems to suggest that a 1% decrease in inflation rates can be translated into a 0.5–2% increase in income per capita.

Mamo (2012) however, seems to suggest the correlation between growth and inflation can vary between positive, negative, and neutral. Fisher (1993) reports a negative relationship between inflation and growth, which is partially, confirmed by Mallik and Chowdhury (2001) for economies with high inflation rates. In economies where inflation is low, they find a positive relationship between the two. Sidrauski (1967) pushes further this discussion by suggesting that inflation has no bearing on growth which is supported by Švigir and Miloš (2017) as their empirical research fails to find a statistically significant relationship between inflation and GDP growth.

On the other hand, numerous studies found a relationship between growth and unemployment. For instance, countries that experienced continuous year-to-year growth have seen a drop in unemployment rates. This was true for countries such as Antigua, Barbuda, Bahamas, and Barbados (Baker, 1997, p. 366; Osinubi, 2005, pp. 157–259). However, the relationship between growth and unemployment does not seem to be very potent. Middle Eastern/Arab countries, like Alger, Jordan, and alike, despite having experienced economic growth, failed to see any drop in unemployment (Al-Habbes & Rumman, 2012).

This holds for Kosovo's economy also, albeit not at a satisfactory level as Misini and Mustafa (2022) find that the growth in Kosovo does have an impact on lowering unemployment, but it does not follow Okun's law. The conventional wisdom dictates that every 1% lowering of the unemployment rate, converts into a 3 percentage points increase in output, which holds for a given set of conditions. In datasets for potential output and the non-accelerating inflation rate of unemployment (NAIRU), the contribution of a 1% lowered unemployment rate is reduced to a 2–3% increase in output (Prachowny, 1993). Ramallari and Merko (2023), resulting in the econometric model made only for Albania, observed that the relationship between inflation, consumption, and net export in this country affects the GDP growth.

However, the lack of a potent relationship between growth and unemployment does not seem to have put off researchers, as some found their

arguments in rapid growth and argue that this growth has to do with government capacities and is correlated to good governance (Acemoglu & Robinson, 2021; Khan, 2007).

This is in line with the postulation that low growth will generate high unemployment which leads to a disproportionate distribution of wealth between many who get impoverished and a few accumulating most of the nation's wealth. Growth is expected to help lift the economy out of poverty if the distribution model is geared more toward equality.

Thus, faster growth can assist in establishing a more just distribution model which is perceived as an important factor in the overall performance of a country (Vijayakumar, 2013). A real-life example of this is Hong Kong's economy which managed to move from a poor to a rich country by using continuous growth as a vehicle (Bade & Parkin, 2020).

To sum up, growth in real terms and improvement of well-being can be attributed to good governance and vice versa, lack of growth and well-being are mainly due to poor institutional governance of the country (Acemoglu & Robinson, 2013). Literature suggests that there is a relationship between governance, institutions, and growth, meaning that strong institutions and effective governance are associated with faster growth (Nikzad, 2021). Furthermore, the establishment of strong institutions can impact significantly economic growth (Tiwari & Bharadwaj, 2021).

Many countries present the success of a country with annual economic growth or unemployment reduction, but this paper will elaborate a broader analysis of macroeconomic indicators to elaborate and scientifically analyse the benefit of this economic growth. Therefore, the paper will present the economic performance of each country of the Western Balkans analysing empirically and in a more multidimensional way. The work will make a special contribution because we do not have more elaborate and analysed works on this econometric model where we will analyse the economic performance of the Balkan countries.

3. RESEARCH METHODOLOGY

The paper will use research methodologies, roles, and objectives in research, research process, and so on. Collection and review of literature and research problem formulas are to identify paper analysis variables (Pandey & Pandey, 2015). Research work requires honest, exhaustive, intelligent research and analysis of facts about a given problem. The findings of a part of the study must be clear to contribute to the field of study (Ferber & Verdoom, 1962).

The paper analyses the uniqueness of the data. These above-mentioned parameters and the findings of the empirical analysis of some authors prove that such a thing should be analysed in a more basic way because the economic theory is directly from it. The basis of such an analysis is the IMF reviewing several countries and establishing this new model for the maturation of the country's economy. Also, the data of the existing literature is that each indicator has affected the GDP, while this new model is based on that by taking the data from the IMF, but the other empirical model for it will be used. The most essential macroeconomic indicators of a country, particularly in Western Balkans countries, have matured.

This paper will look at the indicators of the Western Balkan countries, using secondary data produced by The World Bank, IMF, OECD, statistical offices of respective countries, etc. Annual data for the period from 2010 to 2020 was used for this analysis.

As explained earlier, the economic performance index (EPI) measures a number of macroeconomic indicators looking at three main agents of the economy: households, firms, and government. This study will utilise the approach of Khramov and Ridings Lee (2013) and compose the EPI using the following indicators: *Inflation rate* as a proxy for the monetary positioning of the economy; *Unemployment rate* as an indicator of the production function sustainability of the economy; *Budgetary deficit* as a proportion of the total GDP, to indicate the overall fiscal positioning of the economy; *Change in real GDP*, to evaluate the aggregate performance of the economy as a whole.

In the framework, we will analyse descriptively the methods used in comparison with the methods of analysis, critical methods, as well as being placed in empirical, giving the work a genuine scientific analysis through empirical analysis.

In order to assure comparability among countries, the EPI was constructed as below, in line with Khramov and Ridings Lee (2013). The raw EPI is as follows:

$$EPI_t = 100\% - |Inf(\%) - I_t| - (Unem(\%) - U_t) - (Def/GDP(\%) - Def/GDP_t) + (\Delta GDP(\%) - \Delta GDP_t) \quad (1)$$

where, *Inf(%)* is the current inflation rate; *Unem(%)* is the current unemployment rate; *Def/GDP(%)* is the current budget deficit as a share of GDP; and *ΔGDP(%)* is the real GDP growth rate.

EPI_t is the dependent variable while *Inf*, *Unem*, *Def*, and *ΔGDP* are the independent ones.

The obtained *EPI* values using panel data were used to test the following model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u_e \quad (2)$$

or

$$Y_{EPI_t} = \beta_0 + \beta_1 X_{pt} + \beta_2 X_{at} + \beta_3 X_{ext} + \beta_4 X_{ct} + u_e \quad (3)$$

where, β_0 is the constant term; β_1 is the population size; β_2 is the average monthly wage of the private sector converted to euro; β_3 is the exchange rate[3]; β_4 is the country and u_e is the error term.

The population as a variable was included as a control for size, and the average wages of the private sector are included as an internal measure of the economy's reaction with respect to the performance as measured by EPI. The exchange rate, as an external measure is expected to capture

[3] Exchange rate was obtained by observing the daily exchange rate on the 31st of December of each respective year.

the reaction of the rest of the world regarding the performance of the respective economy, and the country variable should pick up idiosyncrasies of a respective legal framework and other measures impacting the performance of the economy. The econometric model will be discussed in more detail in Section 5.

4. ECONOMIC PERFORMANCE OF THE COUNTRIES OF THE WESTERN BALKANS

The economies of the Western Balkans continue to face an unfavourable environment based on global trends. The post-COVID recovery began to fade in this region, facing new challenges that resulted in rising energy prices, challenging inflation, and weighing on the economic performance of the six Western Balkan countries. Economic growth traded stronger in the first half of 2022 than expected. Private consumption and investments were among the most important in the economic growth of these countries or states of the Western Balkans. Based on the first performance in 2021, employment levels reached historical highs in some countries by mid-2022. Now, in these countries, there are concerns about labour shortages across the region. The unemployment rate in the Western Balkans has decreased by 13.5% by mid-2022, equivalent to a drop in unemployment of 151,000. Recent data suggest that the labour market is starting to cool as employment slows amid high inflation and increased uncertainty. Inflation in food and energy is negatively affecting the citizens of this region. The average fiscal deficit in 2022 is expected to increase by 0.4% points of GDP compared to 2021. In such an environment, public debt remains high in the Western Balkans economy. Inflation is now expected to be double-digit in 2022 in all Balkan countries. Economic activity is slowing significantly in advanced economies, especially in the Eurozone, which is a key source of demand for goods and services in the Western Balkans and a source of investment and remittances in these countries (The World Bank, 2022).

Poor economic growth causes high unemployment and the distribution of income is skewed in favour of a small group of people, who take advantage of workers and manipulate employment by selling products at different prices, etc. Economic growth can be expected to reduce poverty more if income is distributed equally. The fact is that if economic growth is intense, then this growth leads to an improvement in income distribution. If we have real economic growth and a good standard, this is the merit of good governance, but if we have a low standard of living and high unemployment and poverty, it is the responsibility of the institutional poor governance of that country.

Many authors who have studied economic growth see the main result of economic growth in the creation of new jobs since economic growth should result in the creation of new jobs, and in many countries, this has not happened, although many economists have made efforts to study the relationship between economic growth and unemployment (Fuhrmann, 2012).

Given that there is no single agreed indicator for measuring economic performance, there are situations of researchers falling into the trap of 'chasing' positive results. This becomes a problem when such results are at odds with the reality. Hence, this study suggests that the economic performance of a state is measured through a combination of macroeconomic indicators such as unemployment, inflation, public debt, and economic growth.

Measuring economic performance has become commonplace to say that it is important to monitor and evaluate performance as our societies have become more performance-oriented. We expect results that are usually based on performance and incentive systems that are based on metrics. There is a complex relationship between objectives, measures, and actions. If teachers are rewarded for their student's performance in reading text outcomes, they will learn to read, perhaps at the expense of wider recognition of the skill. Politicians are the ones who aim to increase the GDP, but they should also take care of the aspect of quality of life and social justice and urban comfort of noise, air and water pollution, etc. These are very often contradictory to each other, paying attention to social objectives sometimes seems to conflict with the pursuit of economic objectives. If our indicators suggest that pursuing actions aimed at improving broadly defined living standards has a negative effect on the economy, perhaps there is a problem with our economic measurements.

5. ANALYSIS OF MACROECONOMIC INDICATORS FOR COUNTRIES

The paper will include an analysis of the most important macroeconomic indicators of the six countries of the Western Balkans. In the following, we will present the comparative graphs of economic growth, public debt, unemployment, and inflation between these countries.

Table 1. Economic growth (six countries)

Year	*Serbia*	*North Macedonia*	*Albania*	*Bosnia and Herzegovina*	*Montenegro*	*Kosovo*
2010	0.73	3.36	3.71	0.87	2.73	4.94
2011	2.04	2.34	2.55	0.96	3.2	6.32
2012	-0.68	-0.46	1.42	-0.82	-2.72	1.72
2013	2.89	2.93	1	2.35	3.55	5.34
2014	-1.59	3.63	1.77	1.15	1.78	3.3
2015	1.81	3.86	2.22	3.09	3.39	5.9
2016	3.34	2.85	3.31	3.15	2.95	5.6
2017	2.1	1.08	3.8	3.17	4.72	4.8
2018	4.5	2.8	4.02	3.74	5.08	3.4
2019	4.33	3.91	2.1	2.8	4.06	4.8
2020	-0.94	-5.21	-3.96	-3.2	-15.31	-5.34
Min	-1.59	-5.21	-3.96	-3.2	-15.31	-5.34
Max	4.5	3.91	4.02	3.74	5.08	6.32
Aver.	1.68	1.91	1.99	1.57	1.22	3.70

Source: Author's calculation.

Table 1 shows the economic growth of countries of the Western Balkans. Comparing the countries with the highest average economic growth for these periods, Kosovo has 3.70%, a minimum of -5.34%, and a maximum of 6.32%. The second country with economic growth is Albania with 1.99% compared to other countries. In third place with economic growth on average is North Macedonia with 1.91%. The country with the lowest economic growth on average is Montenegro with 1.22%.

Table 2. Unemployment (six countries)

Year	*Serbia*	*North Macedonia*	*Albania*	*Bosnia and Herzegovina*	*Montenegro*	*Kosovo*
2010	19.22	32.02	14.09	27.31	19.65	29.89
2011	22.97	31.38	13.48	27.58	19.67	29.89
2012	24	31.02	13.38	28.01	19.97	30.88
2013	22.15	29	15.87	27.49	19.5	29.77
2014	19.22	28.03	18.05	27.52	18	35.26
2015	17.66	26.07	17.19	27.69	17.54	32.84
2016	15.26	23.72	15.42	25.41	17.72	27.4
2017	13.48	22.38	13.62	20.53	16.07	30.34
2018	12.73	20.74	12.3	18.4	15.17	30.38
2019	10.39	17.26	11.47	15.69	15.12	26
2020	9.01	17.2	13.33	15.27	17.9	26.17
Min	9.01	17.2	11.47	15.27	15.12	26
Max	24	32.02	18.05	28.01	19.97	35.26
Aver.	16.91	25.34	14.38	23.71	17.84	29.89

Source: Author's calculation.

Table 2 shows the unemployment of countries of the Western Balkans. Comparing the countries with the highest average unemployment for these periods, Kosovo has 29.89%, a minimum of 26%, and a maximum of 35.26%. The second country with unemployment is North Macedonia with 25.34% compared to other countries. The third state with unemployment on average is Bosnia and Herzegovina with 23.71%. The country with the lowest unemployment on average is Albania with 14.38%.

Table 3. Inflation (six countries)

Year	*Serbia*	*North Macedonia*	*Albania*	*Bosnia and Herzegovina*	*Montenegro*	*Kosovo*
2010	6.1	1.5	3.6	2	0.7	3.48
2011	11.1	3.9	3.4	3.7	3.5	7.33
2012	7.3	3.3	2	2.1	4.1	2.47
2013	7.7	2.8	1	-0.1	2.2	1.76
2014	2.1	-0.3	1.6	-0.9	-0.7	0.42
2015	1.4	-0.3	3.5	-1	1.5	-0.53
2016	1.1	-0.2	-0.4	-1.6	-0.3	0.27
2017	3.1	1.4	2.1	0.8	2.4	1.48
2018	2	1.5	2	1.4	2.6	1.05
2019	1.8	0.8	1.4	0.6	0.4	2.67
2020	1.6	1.2	1.6	-1.1	-0.3	0.19
Min	1.1	-0.3	-0.4	-1.6	-0.7	-0.53
Max	11.1	3.9	3.6	3.7	4.1	7.33
Aver.	4.11	1.41	1.98	0.53	1.46	1.87

Source: Author's calculation.

Table 3 shows the inflation of countries of the Western Balkans. Comparing the countries with the highest average inflation for these periods, Serbia has 4.11%, a minimum of 1.1%, and a maximum of 11.1%. The second country with inflation is Albania with 1.98% compared to other countries. The third state with inflation on average is Kosovo with 1.87%. The country with the lowest inflation on average is Bosnia and Herzegovina with 0.53%.

Table 4. The budget deficit (six countries)

Year	*Serbia*	*North Macedonia*	*Albania*	*Bosnia and Herzegovina*	*Montenegro*	*Kosovo*
2010	-4.3	-2.41	-3.52	-2.41	-4.6	-0.71
2011	-4.5	-2.47	-3.51	-1.23	-5.1	-0.78
2012	-6.4	-3.8	-3.44	-2.01	-5.8	-2.11
2013	-5.1	-3.84	-4.96	-2.17	-2.3	-3.04
2014	-6.2	-4.19	-5.17	-2.03	-3.1	-2.31
2015	-3.5	-3.48	-4.06	0.7	-7.3	-1.79
2016	-1.2	-2.7	-1.81	1.24	-2.8	-1.48
2017	1.1	-2.73	-2	2.58	-5.7	-1.19
2018	0.6	-1.75	-1.6	2.2	-3.8	-2.62
2019	-0.21	-1.98	-1.88	1.92	-4.5	-2.64
2020	-8.1	-8.09	-7.02	1.72	-4.5	-7.5
Min	-8.1	-1.75	-7.02	-2.41	-7.3	-7.5
Max	1.1	32.02	-1.6	2.58	-2.3	-0.71
Aver.	-3.43	-3.40	-3.54	0.04	-4.5	-2.37

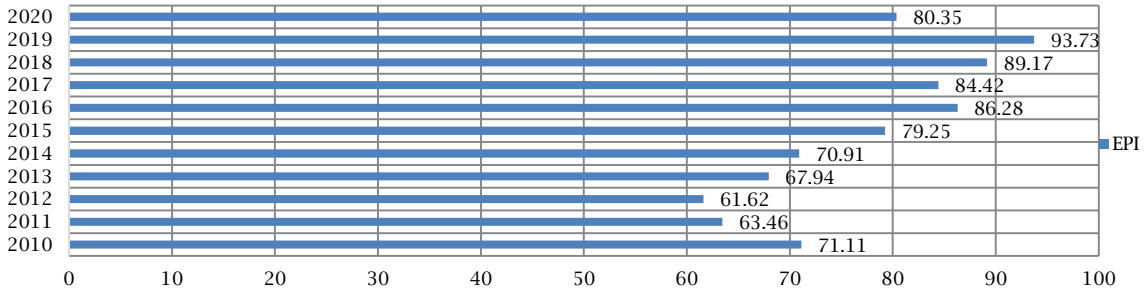
Source: Author's calculation.

Table 4 shows the budget deficit of countries of the Western Balkans. Comparing the countries with the highest average budget deficit for these periods, Montenegro has -4.5%, a minimum of -7.3%, and a maximum of -2.3%. The second country with a budget deficit is Albania with -3.54% compared to other countries. The third state with a budget deficit on average is Serbia with -3.43%. The country with the lowest budget deficit on average is Bosnia and Herzegovina with 0.04%.

6. THE EMPIRICAL ANALYSIS

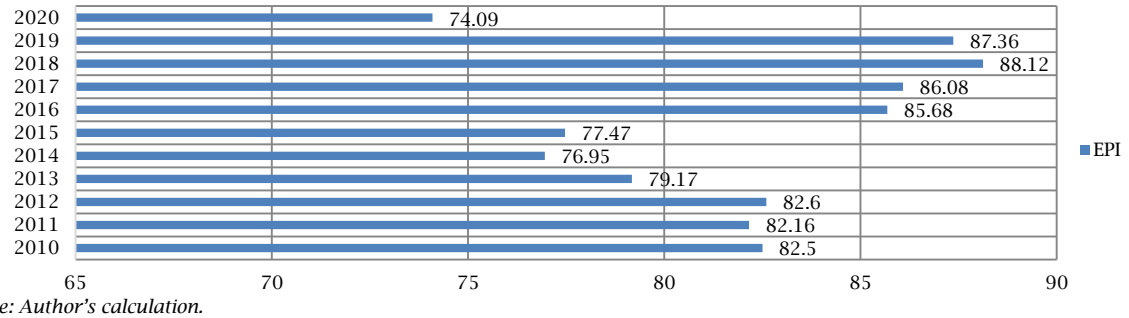
The empirical study is commenced by visualising the available data. For each country, the EPI is plotted against a decade of respective economic performance.

Figure 1. EPI for Serbia



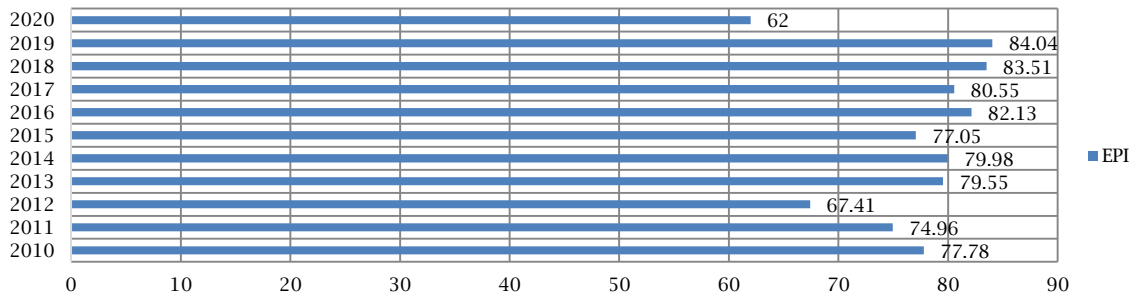
Source: Author's calculation.

Figure 2. EPI for Albania



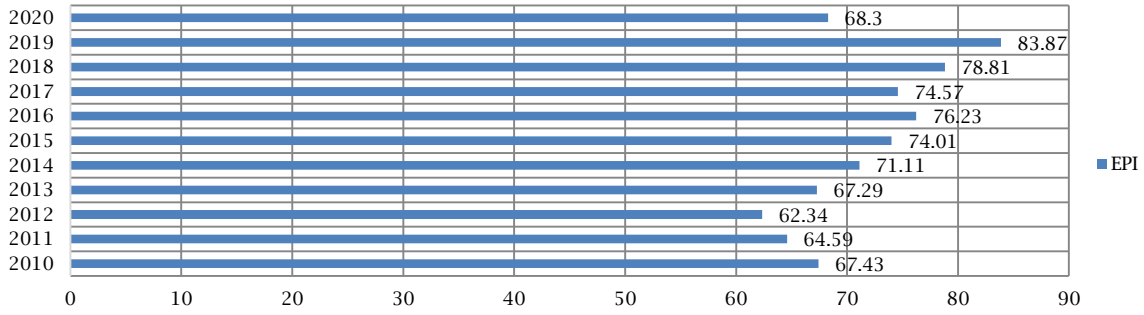
Source: Author's calculation.

Figure 3. EPI for Montenegro



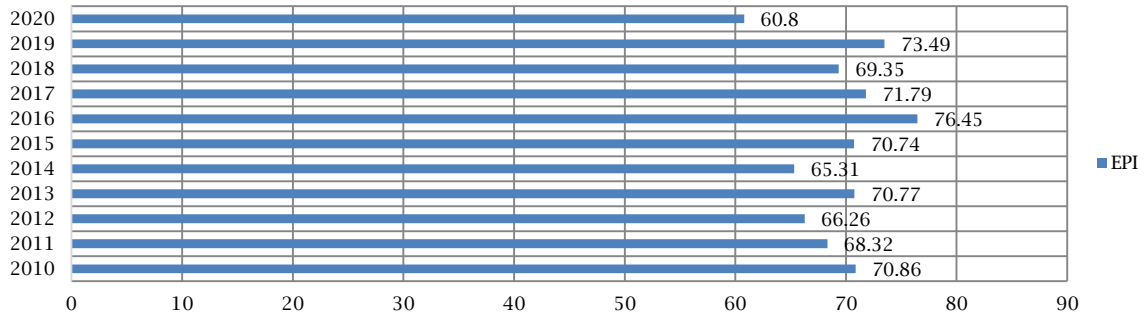
Source: Author's calculation.

Figure 4. EPI for North Macedonia



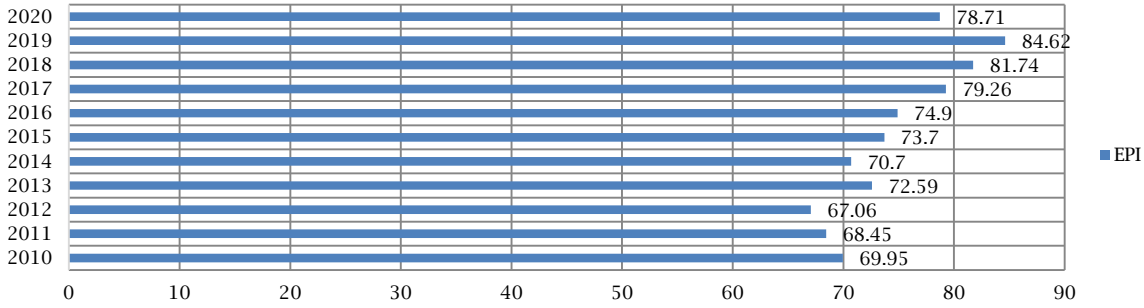
Source: Author's calculation.

Figure 5. EPI for Kosovo



Source: Author's calculation.

Figure 6. EPI for Bosnia and Herzegovina



Source: Author's calculation.

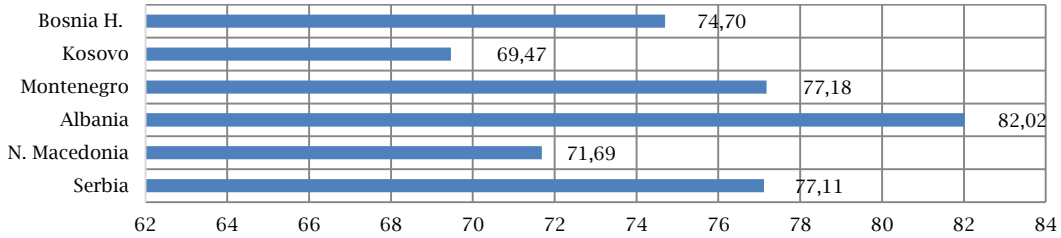
Figures 1–6 reflect more or less similar development trends. However, an interesting observation emerged as in 2020 all countries suffered a drop in their respective EPIs. This can be attributed to the COVID-19 pandemic that the entire globe was fighting. However, the drop was more severe for some than others. It can be argued that Albania, Montenegro, and Kosovo suffered more in 2020 than the other three, due to the importance of the tourism industry[4] in their respective EPI[5]. This is in line with the predictions made by Yotzov et al. (2020) for Bulgaria and the expected impact of COVID-19 on Bulgaria's tourism.

Plotting the mean EPI for all countries in the dataset provides insight into the comparability of these regional economies.

[4] Lack of tourists in these countries adversely affected the demand for seasonal work, hotel and lodging services, and overall money supply, thus the drop in the respective EPI is much sharper.

[5] In the case of Kosovo, the effect created by the lack of tourist inflow, is mimicked by the lack of visits by Kosovo's diaspora.

Figure 7. EPI means



Source: Author's calculation.

Using Khramov and Ridings Lee's (2013, p. 12) classification, and based on these results, except for Albania which is classified as 'Fair' all other countries in this dataset are classified as 'Poor'. With the information obtained from the visualisation of the data, this study turns to modelling the data using a more advanced statistical methodology. As shown in Table 5 below, there is data for each country covering 11 years of the period 2010–2020, totalling 66 observations.

Table 5. Descriptive statistics (six countries)

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*
EPI	66	75.35985	7.705662	60.8	93.73
Population	66	3001871	2059649	619428	7277787
XE3112	66	52.93695	56.72006	1	140.4797
AGMSPrE	66	382.9975	141.2659	135.2697	740.3365
CountryID	66	3.5	1.720912	1	6

Source: Author's calculation.

The authors used a panel data approach to estimate Model 1 described above. By setting country and year as panel variables, data were regressed and the following results were obtained. To test for the specification of the model, a random effects regression was run, and the following results were obtained:

Table 6. Regression results

Model summary						
Dep. variable: EPI				Number of obs. = 66		
Method: Random-effects GLS regression				Number of groups = 11		
Group variable: Year				Obs per group: min = 6		
R-sq: within = 0.5587				avg = 6.0		
between = 0.2137				max = 6		
overall = 0.3717				Wald chi²(4) = 60.84		
corr(u_i, X) = 0 (assumed)				Prob > chi² = 0.0000		
Parameter estimates						
EPI	*Coef.*	*Std. Err.*	*z*	*P>|z|*	*[95% Conf.*	*interval]*
Population	-2.10E-06	5.07E-07	-4.14	0.000	3.09E-06	-1.10E-06
XE3112	0.0947861	0.0146088	6.49	0.000	0.0661535	0.1234188
AGMSPrE	0.0315823	0.0056547	5.59	0.000	0.0204992	0.0426653
CountryID	-0.4527817	0.3616954	-1.25	0.211	-1.161692	0.2561283
_cons	66.13021	2.473402	26.74	0.000	61.28243	70.97799
Sigma u	3.4741978					
Sigma e	4.2958425					
rho	0.39542414 (fraction of variance due to *u_i*)					

Source: Author's calculation.

The Breusch and Pagan Lagrangian multiplier test for random effects and other diagnostic tests show the model to be well-specified and appropriate for this analysis (see Appendix A). As a robustness check for the model, a regression of the same model was run with fixed effects, and the results do not show any meaningful difference in terms of the statistical significance of estimates (printout in Appendix B).

Also, most variables are statistically significant at a 1% level of confidence. In addition, these results from the regression mostly do not contradict common knowledge and expectations as variables mainly display the anticipated sign. Having said that, 'population' which is a control for size, displays an inverse correlation to the dependent variable EPI. According to these results, all else equal, an increase in population by 0.0000002 percentage points will result in a drop of EPI by one percentage point. The data available does not allow for a deeper investigation of this unexpected relationship, but the high migration of young and trained population to Western Europe gathered with the aging population in most countries in the dataset, perhaps can be offered as an intuitive explanation.

7. RESULTS

The exchange rate is of the expected positive sign, and statistically at 1% which can be interpreted that, ceteris paribus changes in EPI are reflected in the same direction on the exchange rate. Also, the private sector seems to be prompt to reflect changes in EPI as the variable in the regression for

the average monthly wages is of the expected positive sign and statistically significant at 1%. A finding from this dataset worth mentioning is the fact that if the same regression is run, with the single difference of plugging average monthly wages (see Appendix C), the variable becomes statistically insignificant, which can be interpreted that the influence of the public sector is very large in these economies and overpowers the impact of the private sector average wages. The results are similar also when a regression with separate variables for average monthly wages for the private and public sectors is run. The average monthly wages for the public sector are statistically insignificant while the average monthly wages for the private sector are positive and statistically significant at 1% (see Appendix C)[6].

8. DISCUSSION

Many economists use economic growth to calculate a state's or country's economic performance. However, economic progress does not always result in increased economic well-being for a country's population. As a result, a critical view of these economic theories for economic performance within the context of GDP metrics is born. Some countries measure economic success by the increase in per capita income. Similarly, some countries that have a problem with unemployment, such as the Western Balkans, calculate the success of economic performance through the reduction of unemployment without accounting for the high emigration that these countries have, which directly affects the reduction of unemployment, or they calculate the success of salary increases without accounting for inflation, etc. We have countries that evaluate economic performance as having very high accomplishments through infrastructure spending but do not include public debt. Politicians are the ones who most often brag about such outcomes, but economists also brag about the same outcomes that politicians do.

As a result of analysing the concrete results of these Western Balkans countries, we conclude that these countries have economic growth but no increase in social-economic well-being because the most important indicators of their social-economic well-being have not been analysed. According to the structure of the IMF, the countries with the highest economic growth in Europe are impoverished. There is a shortage of literature for such an analysis of the empirical model we employed. As a result, the idea arose for the need and analysis of indicators that present the most realistic economic performance of the Western Balkan countries through the empirical model, which we used by analysing their economic performance for each country and categorizing the countries according to the structure of the economic performance (Misini & Tosuni, 2023).

9. CONCLUSION

In conclusion, this study finds that EPI as an index is informative and in line with common wisdom and economic theory. This is true for the analysis carried out in this study as the results generated are grounded in theory in addition to being intuitive and sensible. Furthermore, in terms of WB6, EPI has managed to provide a reasonable representation of the actual performance of respective countries. In addition, EPI has picked up the effect of the COVID-19 pandemic in these economies while the authors provide a possible explanation for the divergence of EPI among countries in the database. The paper will present the most realistic overview of the life and economic performance of the Western Balkan countries, so this will be useful for society to see that economic growth has not affected the development of the well-being of citizens in Western Balkan countries.

Further, it will be easier to analyse because it will be possible to use data for more years. In this work, we have been limited by the lack of data for many years. Advanced statistical modelling has provided insights into how EPI translates in the real economy, both, inside and outside. The average monthly wages of the private sector have shown a positive and statistically significant relationship to EPI, offering evidence that the private sector, as expected, is quicker to respond to changes in the overall performance of respective economies. In the same way, the statistically significant and positive relationship between EPI and exchange rates indicates that external factors are able to adjust correctly and promptly.

The paper has measured the most important macroeconomic indicators for these Balkan states and based on the findings of the empirical results we conclude that the state that has the lowest unemployment, that state has good economic performance compared to other states.

Furthermore, arguing for the advantages of EPI as a measure of overall economic performance of the economy, this study has shown the ability of this measure to capture the effects of external shocks (such as pandemics) which has helped the authors to understand better the disparity of EPI for each country, especially in the final year of data analysed which is the year 2020.

The importance of future work remains an analytical and research challenge based on more data in the analysis. Also, the research and analysis limitations are not included in the research in the data limitation to measure the global impact of the Russia-Ukraine war on the direct or indirect impact on the EPI of these six countries of the Western Balkans.

[6] The reason why the specification with only the private average monthly wages is reported instead of this model lies in the fact that due to missing data, this specification reduces the number of observations to 55, thus having a diminished explanatory power compared to the main reported model with 66 observations.

REFERENCES

1. Acemoglu, D., & Robinson, J. A. (2013). *Why nations fail: The origins of power, prosperity, and poverty* (1st ed.). Crown Business.
2. Adam, C. S., & Bevan, D. L. (2005). Fiscal deficits and growth in developing countries. *Journal of Public Economics, 89*(4), 571–597. https://doi.org/10.1016/j.jpubeco.2004.02.006
3. Aghion, P., & Kharroubi, E. (2008). *Cyclical macro policy and industry growth: The effect of counter-cyclical fiscal policy* (Working Paper No. 837). Harvard University. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=ac09441cccce62e29e8838a56043553c2b317fa8
4. Aizenman, J., Kletzer, K., & Pinto, B. (2007). *Economic growth with constraints on tax revenues and public debt: Implications for fiscal policy and cross-country differences* (NBER Working Paper No. 12750). National Bureau of Economic Research. https://doi.org/10.3386/w12750
5. Al-Habbes, M. A., & Rumman, M. A. (2012). The relationship between unemployment and economic growth in Jordan and some Arab countries. *World Applied Sciences Journal, 18*(5), 673–680. http://idosi.org/wasj/wasj18(5)12/12.pdf
6. Andrés, J., & Hermando, I. (1997). *Does inflation harm economic growth: Evidence for the OECD* (Working Paper No. 6062). National Bureau of Economic Research. https://doi.org/10.3386/w6062
7. Aryani, Y. A., Gantyowati, E., Nurrahmawati, A., Arifin, T., & Sutaryo, S. (2023). Determinants of local government public service quality: Evidence from the developing economy [Special issue]. *Journal of Governance & Regulation, 12*(1), 218–229. https://doi.org/10.22495/jgrv12i1siart2
8. Bade, R., & Parkin, M. (2020). *Foundations of macroeconomics* (9th ed.). Pearson College Div.
9. Baker, J. L. (1997). *Poverty reduction and human development in the Caribbean: A cross-country study* (Discussion Paper No. 366). The World Bank. https://doi.org/10.1596/0-8213-3970-2
10. Baldacci, E., & Kumar, M. (2010). *Fiscal deficits, public debt and sovereign bond yield* (IMF Working Paper No. 10/184). International Monetary Fund. https://doi.org/10.5089/9781455202188.001
11. Checherita-Westphal, C., & Rother, P. (2012). The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. *European Economic Review, 56*(7), 1392–1405. https://doi.org/10.1016/j.euroecorev.2012.06.007
12. Chutipat, V., Sonsuphap, R., & Pintong, W. (2023). Bio-circular-green model in a developing economy. *Corporate Governance and Organizational Behavior Review, 7*(1), 150–157. https://doi.org/10.22495/cgobrv7i1p14
13. Cook, W. L., & Kenny, D. A. (2005). The actor–partner interdependence model: A model of bidirectional effects in developmental studies. *International Journal of Behavioural Development, 29*(2), 101–109. https://doi.org/10.1080/01650250444000405
14. Dynan, K., & Sheiner, L. (2018). *GDP as a measure of economic well-being* (Hutchins Working Paper No. 43). Brookings. https://www.brookings.edu/articles/gdp-as-a-measure-of-economic-well-being/
15. Elmendorf, D., & Mankiw, N. G. (1999). Government debt. In J. B. Taylor & M. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1C, pp. 1615–1669). North-Holland.
16. Ferber, R., & Verdoorn, P. J. (1962). *Research methods in economics and business*. The Macmillan Company.
17. Fischer, S. (1993). *The role of macroeconomic factors in economic growth* (NBER Working Paper No. 4565). National Bureau of Economic Research. https://doi.org/10.3386/w4565
18. Fuhrmann, M. (2012). Splitting atoms: Why do countries build nuclear power plants? *International Interactions, 38*(1), 1–37. https://doi.org/10.2139/ssrn.1832504
19. Gale, G. W., & Orszag, R. P. (2002, December 17). *The economic effects of long-term fiscal discipline*. The Brookings Institution. https://www.brookings.edu/articles/the-economic-effects-of-long-term-fiscal-discipline/
20. Gashi, B. (2020). The impact of public debt on the economic growth in South Eastern Europe: An empirical panel investigation. *Economic Studies/Ikonomicheski Izsledvania, 29*(2), 3–18. https://www.iki.bas.bg/Journals/EconomicStudies/2020/2020-2/1_Burim-Gashi_f-f.pdf
21. Georgescu, G. (2016). *The gross domestic product. History, relevance and limitations in its interpretation* (MPRA Paper No. 73644). MPRA. https://mpra.ub.uni-muenchen.de/73644/1/MPRA_paper_%2073644.PDF
22. International Labour Organization (ILO). (2022, April 25). *Unemployment, total (% of total labor force) (modeled ILO estimate)*. The World Bank. https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
23. International Monetary Fund (IMF). (n.d.). *Government finance statistics (GFS)*. https://data.imf.org/?sk=a0867067-d23c-4ebc-ad23-d3b015045405
24. Khan, H. M. (2007). *Governance, economic growth and development since the 1960* (DESA Working Paper No. 54) Economics & Social Affairs. https://www.un.org/esa/desa/papers/2007/wp54_2007.pdf
25. Khramov, V., & Ridings Lee, J. (2013). *The economic performance index (EPI): An intuitive indicator for assessing a country's economic performance dynamics in an historical perspective* (IMF Working Paper No. 13/214). International Monetary Fund. https://doi.org/10.5089/9781484381298.001.A001
26. Kirova, A. (2010). *Novoto keynsianstvo-mikroikonomicheski osnovi i vrazka s makroikonomicheskata politika*. Stopanstvo.
27. Mallik, G., & Chowdhury, A. (2001). Inflation and economic growth: Evidence from South Asian Countries. *Asia-Pacific Development Journal, 8*(1), 123–135. https://www.unescap.org/sites/default/files/apdj-8-1-ResearchNote-Mallik-and-Chowdhury.pdf
28. Mamo, F. T. (2012). *Economic growth and inflation* [Master's thesis, Södertörns University]. Digitala Vetenskapliga Arkivet. http://sh.diva-portal.org/smash/get/diva2:576024/FULLTEXT01.pdf
29. Mihaylova-Borisova, G., & Nenkova, P. (2021). DEA efficiency approach in comparing macroeconomic performance of EU and Balkan Countries. *Economic Studies, 30*(6), 42–62. https://www.iki.bas.bg/Journals/EconomicStudies/2021/2021-6/3_Mihaylova-Borisova_f_f.pdf
30. Misini, S. & Badivuku, M. (2016). Parameters of economic growth in Kosovo. *Journal of Economics and Business Research, 22*(2), 227–244. https://www.uav.ro/jour/index.php/jebr/article/view/818
31. Misini, S., & Mustafa, B. (2022). The relationship between economic growth, unemployment and poverty. *Corporate Governance and Organizational Behavior Review, 6*(4), 57–63. https://doi.org/10.22495/cgobrv6i4p5
32. Misini, S., & Tosuni, G. (2023). The effects of the war in Ukraine on the economic performance of Western Balkan countries. *InterEULawEast, 10*(1), 83–99. https://doi.org/10.22598/iele.2023.10.1.5

33. Modigliani, F. (1961). Long-run implications of alternative fiscal policies and the burden of the national debt. *The Economic Journal, 71*(284), 730–755. https://doi.org/10.2307/2228247
34. Mohan, D. (2015). The macroeconomics of "Oil Prices" and "Economic Shocks": Lessons from the 1970s. *Risk governance & control: Financial markets & institutions, 5(4),* 80–90. https://doi.org/10.22495/rgcv5i4art7
35. Motofei, C. (2017). Vectors of economic growth in the eastern area of the EU. *Theoretical and Applied Economics, 24*(1(610)), 215–226. http://store.ectap.ro/articole/1257.pdf
36. Nikzad, R. (2021). Governance, institutions, and economic development. *International Journal of Innovation and Economic Development, 7*(4), 7–22. https://doi.org/10.18775/ijied.1849-7551-7020.2015.74.2001
37. Obeidat, M., Al-Tarawneh, A., Omet, G., Khataybeh, M., & Khamees, B. (2022). Macroeconomic performance and the budget deficit in Jordan: A trigger point for change in the aftermath of COVID-19 [Special issue]. *Journal of Governance & Regulation, 11*(2), 340–345. https://doi.org/10.22495/jgrv11i2siart13
38. Organisation for Economic Co-operation and Development (OECD). (2023). *General government deficit (indicator).* https://doi.org/10.1787/77079edb-en
39. Osinubi, T. S. (2005). Macroeconometric analysis of growth, unemployment and poverty in Nigeria. *Pakistan Economic and Social Review, 45*(2), 249–269. http://pu.edu.pk/images/journal/pesr/PDF-FILES/7%20OSINUBI%20Macroeconometric%20Analysis%20of%20Nigeria.pdf
40. Pandey, P., & Pandey, M. M. (2015). *Research methodology: Tools and techniques.* Bridge Center. https://euacademic.org/BookUpload/9.pdf
41. Prachowny, M. F. J. (1993). Okun's law: Theoretical foundations and revised estimates. *The Review of Economics and Statistics, 75*(2), 331–336. https://doi.org/10.2307/2109440
42. Ramallari, A., & Merko, F. (2023). The relationship between inflation and gross domestic product: Albania case. *Corporate Law & Governance Review, 5*(1), 83–91. https://doi.org/10.22495/clgrv5i1p7
43. Reinhart, C. M., & Rogoff, K. S. (2009). Growth in a time of debt. *American Economic Review, 100*(2), 573–578. https://scholar.harvard.edu/files/rogoff/files/growth_in_time_debt_aer.pdf
44. Saint-Paul, G. (1992). Fiscal policy in an endogenous growth model. *The Quarterly Journal of Economics, 107*(4), 1243–1259. https://doi.org/10.2307/2118387
45. Sedlacek, W. E. (2011). Using noncognitive variables in assessing readiness for higher education. *Readings on Equal Education, 25*, 187–205. https://web.augsburg.edu/em/UsingNCV-Sedlacek.pdf
46. Sidrauski, M. (1967). Rational choice and patterns of growth in a monetary economy. *The American Economic Review 57*(2), 534–544. https://faculty.econ.ucdavis.edu/faculty/kdsalyer/LECTURES/Ecn200e/sidrauski_money.pdf
47. Švigir, M., & Miloš, J. (2017). Relationship between inflation and economic growth; Comparative experience of Italy and Austria. *Financije i Parvo (FIP), 5*(2), 91–101. https://hrcak.srce.hr/file/285035
48. Tiwari, A., & Bharadwaj, T. (2021) Assessing the impact of institutions on economic growth in the BRICS countries. *BRICS Journal of Economics, 2*(4), 30–46. https://doi.org/10.38050/2712-7508-2021-4-2
49. The World Bank. (2021). *Western Balkans regular economic report* (Report No. 20). https://doi.org/10.1596/36402
50. The World Bank (2022). *Western Balkans regular economic report* (Report No. 22). https://documents1.worldbank.org/curated/en/099010110192229651/pdf/P17947808ec26c001094ac004a1b5d70a2a.pdf
51. Vijayakumar, S. (2013). An empirical study on the nexus of poverty, GDP growth, dependency ratio and employment in developing countries. *Journal of Competitiveness, 5*(2), 67–82. https://doi.org/10.7441/joc.2013.02.05
52. Woo, J. (2009). Why do more polarized countries run more procyclical fiscal policy? *The Review of Economics and Statistics, 91*(4), 850–870. https://doi.org/10.1162/rest.91.4.850
53. Yotzov, V., Bobeva, D., Loukanova, P., & Nestorov, N. (2020). Macroeconomic implications of the fight against COVID-19: First estimates, forecasts, and conclusions. *Economic Studies/Ikonomicheski Izsledvania, 29*(3), 3–28. https://www.iki.bas.bg/Journals/EconomicStudies/2020/2020-3/1_Victor_f-f.pdf

APPENDIX A. DIAGNOSTICS TESTS

Breusch and Pagan Lagrangian multiplier test for random effects:

$$EPI[Year, t] = Xb + u[Year] + e[Year, t] \quad \text{(A.1)}$$

Table A.1. Estimated results

Model summary		
Test: Var(u) = 0 chibar2(01) = 45.91 Prob > chi² = 0.0000		
	Var	***sd***
EPI	59.37723	7.705662
e	18.45426	4.295843
u	12.07005	3.474198

Note: sd = sqrt(Var).

Figure A.1. Histogram IPE

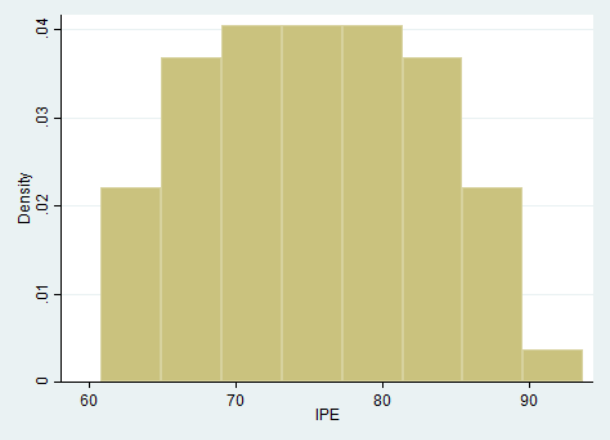


Table A.2. Correlation (EPI, Population, XE3112, AGMSPrE, CountryID)

Variable	*EPI*	*Population*	*XE3112*	*AGMSPrE*	*CountryID*
EPI	1.0000				
Population	0.1116	1.0000			
XE3112	0.3392	0.5888	1.0000		
AGMSPrE	0.2791	0.5254	-0.0292	1.0000	
CountryID	-0.1649	0.3685	0.0857	0.1436	1.0000

APPENDIX B. ROBUSTNESS CHECK

Table B.1. Regression results

Model summary						
Dep. variable: EPI Method: Fixed-effects (within) regression Group variable: Year R-sq: within = 0.5589 between = 0.2136 overall = 0.3710 corr(u_i, X) = 0.0644				Number of obs. = 66 Number of groups = 11 Obs per group: min = 6 avg = 6.0 max = 6 F(4,51) = 16.15 Prob > F = 0.0000		
Parameter estimates						
EPI	***Coef.***	***Std. Err.***	***t***	***P>|t|***	***[95% Conf. interval]***	
Population	-2.03E-06	4.85E-07	-4.19	0.000	-3.01E-06	-1.06E-06
XE3112	0.09344	0.013941	6.70	0.000	0.065452	0.1214278
CountryID	-0.46681	0.344276	-1.36	0.181	-1.15797	0.2243525
AGMSPrE	0.030626	0.005437	5.63	0.000	0.019711	0.0415407
_cons	66.41875	2.120622	31.32	0.000	62.16142	70.67607
Sigma u	4.987774					
Sigma e	4.295843					
rho	0.574121 (fraction of variance due to *u_i*)					
F-test that all u_i = 0 F(10, 51) = 8.02 Prob > F = 0.0000						

APPENDIX C. REGRESSION RESULTS

Table C.1. Regression results (average monthly wages)

Model summary						
Dep. variable: EPI				Number of obs. = 66		
Method: Fixed-effects (within) regression				Number of groups = 11		
Group variable: Year				Obs per group: min = 6		
R-sq: within = 0.2970				avg = 6.0		
between = 0.2226				max = 6		
overall = 0.1246				F(4,51) = 5.39		
corr(u_i, X) = 0.0.0812				Prob > F = 0.0000		
Parameter estimates						
EPI	***Coef.***	***Std. Err.***	***t***	***P>|t|***	***[95% Conf. interval]***	
Population	-2.61E-07	4.61E-07	-0.57	0.573	-1.19E-06	6.64E-07
XE3112	0.0549128	0.0152788	3.59	0.001	0.0242394	0.0855862
CountryID	-0.135446	0.8403969	-0.16	0.873	-1.822613	1.551721
AGMSPrE	-0.0099117	0.010378	-0.96	0.344	-0.0307465	0.0109231
_cons	78.63063	3.282805	23.95	0.000	72.04013	85.22114
Sigma u	5.6140049					
Sigma e	5.4231387					
rho	0.5172879 (fraction of variance due to *u_i*)					
F-test that all u_i = 0 F(10, 51) = 5.83 Prob > F = 0.0000						

Table C.2. Regression results (average monthly wages, both public and private sectors)

Model summary						
Dep. variable: EPI				Number of obs. = 55		
Method: Fixed-effects (within) regression				Number of groups = 11		
Group variable: Year				Obs per group: min = 5		
R-sq: within = 0.6867				avg = 5.0		
between = 0.0857				max = 5		
overall = 0.4125				F(5,39) = 17.10		
corr(u_i, X) = 0.0221				Prob > F = 0.0000		
u_i = 0						
Parameter estimates						
EPI	***Coef.***	***Std. Err.***	***t***	***P>|t|***	***[95% Conf. interval]***	
Population	-2.72E-06	8.37E-07	-3.26	0.002	-4.42E-06	-1.03E-06
XE3112	0.1156735	0.0272768	4.24	0.000	0.0605009	0.170846
CountryID	-0.2647216	0.7454629	-0.36	0.724	-1.772563	1.243119
AGMSPrE	-0.0172861	0.0098331	-1.76	0.087	-0.0371754	0.0026033
_cons	0.0548862	0.0123776	4.43	0.000	0.0298502	0.0799222
Sigma u	5.3809026					
Sigma e	4.0048018					
rho	0.64353127 (fraction of variance due to *u_i*)					
F test that all u_i = 0 F(10, 39) = 8.82 Prob > F = 0.0000						