Public spending and economic growth: Evidence from the Western Balkans

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Abstract

The objective of this study is to examine the relationship between public expenditures, foreign investments, and the growth of the Gross Domestic Product (GDP) for the years 2002-2021 in the countries of the Western Balkans (BB6) and Croatia. The analysis includes data on $2.8 trillion of GDP, $668 billion of public expenditures, and $160 billion of FDI for these states. The methodology used in this study is based on a detailed examination of public expenditures and their impact on the Gross Domestic Product. This article investigates two hypotheses, thoroughly assessing their impact on GDP growth. Through the use of the Ordinary Least Squares (OLS) econometric model, concrete results with over 95% reliability have been obtained. The variables are determined based on multiple regressions for the findings we will obtain based on econometric calculations using the fixed effects, standard deviation, mean, and linear regression models. The findings of this study relate directly to the stated aims and objectives of the publication. The results presented in the study are an essential component of the study's conclusions. We found that some independent factors have a uniform impact on GDP growth, while others have a significant impact on real growth. Also, our findings confirm economic theories that argue that an increase in government spending leads to an increase in GDP. The data show that public investment in the Western Balkans has historically been overlooked, a gap in the literature that our research attempts to fill.

1. Introduction

Public expenses are an important factor; each state has its own management regulated by law, based on the specifics of the country, with the aim of rational use and GDP growth. Economic growth in the countries of the Western Balkans, including Croatia, is a matter of constant discussion among theorists and experts from the fields of macroeconomics and political making. Some authors or researchers share the opinion that the economic growth in the 6 countries of the Western Balkans and Croatia has come as a result of foreign direct investments, the continued growth of public and private investments, and, according to the report, the increase in salaries and pensions in the public sector in Serbia, Kosovo, and Bosnia and Herzegovina, while the increase in exports in Albania and North Macedonia has stimulated economic growth in these countries in the period 2017-2020.

Numerous studies found during the assessment of the literature have confirmed that there is a negative correlation between governmental spending and economic growth(Ziberi, Miftari, & Omaj, 2021). State revenues are collected and expressed in money intended for public spending(Andrés-Rosales, Quintana-

Romero, De Jesús-Almonte, & Del Río, 2021). The good functioning of legal-public organizations that realize public goods in an effective and efficient way achieves the realization of economic and social objectives in the public interest by increasing the reliability of public money. The efficiency of spending public money with the purpose of allowing economic activity and allowing the conditions for the efficient operation of public and private organizations is in favor of the growth of economic activity, where the possibility of investments and the opening of new businesses increases. This has also been proven in the studies of Fokam, Ningaye, and Nembua (2020) that show a connection between public spending and foreign investments, which affect economic growth. The treatment of this problem in our study gives support to this practice through empirical measurements that show the connection with economic growth. Allowing the conditions and doing business in the countries of the WB region has created new opportunities and has encouraged FDI by attracting them to the opening of new businesses in the development of technology, as a good opportunity that has used the potential of human resources. as the potential of the free cost in the market(Epure & Barna, 2021).

WB countries are in open competition to attract FDI by offering favourable conditions for doing business through the provision of the necessary infrastructure and business parks with favourable conditions for increasing investments with the aim of reducing unemployment, which remains a challenge in this region. In this region, the needs for public investments are great, and debates have arisen about the orientation of public expenditures in providing the conditions for FDI. But there are studies that support the positive role of FDI, reasoning with the positive role they can play in economic growth(Weigel, 2020). As the data is presented, from the importance and participation in public revenues, taxes should be distinguished as the main form, which participate on average of 70%-80%, in the general revenues of the state, which directly affects the increasing public spending. The data shows that the countries (WB6 including Croatia) realize revenues from the taxes collected at the border, which shows that economic activity is more import-oriented. This shows a lot that these countries still carry out most of their economic activity through imports, but it is a good opportunity to offer favorable conditions for businesses and the private sector through the realism of infrastructure investments(Pula & Elshani, 2018). Providing good conditions to business parks and equal competition allowed for the increase in government spending as a good opportunity to stimulate growth and economic development. In the empirical findings of this research paper, it appears that we have a significant increase in public spending with an average of 9.50 billion euros, that we have an increase from the minimum of 8.79 billion to the maximum of 10.45 billion Euros, with a direct impact on GDP(WB, 2020).

The high participation rate of 70% of the total income in this country indicates economic dependence on others. The rise in public spending was a result of the corporate community's increased understanding of the need to be fiscalized. The redistribution of income affects the economic and social position of the population according to their activities, economic power, and social position(Engelhardt, 2021). Economic needs through public revenue factors indirectly determine the implementation of financial policy instruments. Economic factors are encouraged through the structure of investments, according to government priorities, and through the implementation of financial and economic policy(Tsvetkov & Georgieva, 2021). The essence is the creation of economic and social stability, which affects social equality. As important factors, they are used to promote economic development in WB6 countries. They showed that public spending directly affects the growth of economic development, which promotes production and exports according to branches and economic fields(Bajra, Halili, & Berisha, 2020). High supervision and increased transparency increase and enable eintegrity and development through Transparency and accountability are important factors in the realization of public money expenditures(Belova, 2021). The findings of our study are consistent with the data, which demonstrate a connection between corruption and GDP growth. In many countries, the increase in public expenditures, especially capital ones, leads you to think that it has to do with corruption. Although the WB countries have the same problem, one of the obstacles shown in the international reports is the high level of corruption and an increase in accountability and ethics is always required.

The findings from studies employing two separate Engle-Granger approaches consistently indicate a lack of co-integration, ultimately implying that we cannot make conclusive statements about the long-term nexus between corruption and economic growth. The estimation results show that government expenditure and corruption control have a negative impact on economic growth(Nguyen & Bui, 2022). This situation further exacerbates itself by diminishing the allocation of resources towards essential public investments and diverting funds instead towards unproductive endeavors and massive public infrastructure projects. This setback not only hampers immediate economic progress but also poses a significant threat to the prospects of attaining sustainable development in the foreseeable future. When looking at the intricate dynamics of the Gross Domestic Product (GDP) across these countries over a two-decade period, a recognizable pattern with a steady upward trajectory emerges. However, a notable deviation occurred in the year 2020, when a sharp downturn was witnessed. This anomaly can be directly attributed to the far-reaching ramifications of the COVID-19 pandemic, which sent shockwaves through the global economy, causing a sharp contraction in output and economic activity across the board. The ensuing repercussions have underlined the imperative of fortifying resilience and adaptability in the face of unforeseen global crises(WB, 2020).

Although there was a reduction in GDP in 2020, it was not observed in public expenditures, which were in relation to the trends of the past years(Bajra et al., 2020). According to the data presented after the crisis that was caused by the closure of the economy due to the COVID-19 pandemic, in 2021 there was a rise in the

Gross Domestic Product of WB 6 countries, on average, of 7.4%. The rise of governmental revenues and spending has been positively impacted by this and, to a lesser extent, by private investments and rapid growth in goods exports(Krajišnik, Gligorić, & Gojković, 2019; WB, 2020; Ziberi et al., 2021). The economic structure of the WB countries is similar in terms of GDP, and they have the same challenges in terms of economic sustainability. The GDP of the Western Balkans, including Croatia, is estimated to have reached 186.86 billion US. dollars in 2021. If we analyse the structure of the GDP, it can be observed that 36.30% of it is the GDP of Croatia, 33.75% of it is made up of the GDP of Serbia, 10.24% of the GDP of Bosnia-Herzegovina, and 7.27% of the GDP of Albania, with 5.84% of the GDP of North Macedonia, 2.43% of Montenegro, and 4.17% of the GDP of Kosovo. In a similar trajectory, we also have public expenditure, which in total for these countries is worth 52.64 billion dollars, while FDI is worth 10.82 billion dollars.

This paper aims to answer a question regarding the impact of public spending on economic growth, which leads to the confirmation of the hypothesis of these studies that the increase in the gross domestic product is impacted by the rise in public spending, and the second hypothesis is that with the increase in FDI as a result of the factors of doing business, the gross domestic product also increased. This paper aims to contribute in three directions. First, the long-term period of the analysis has included a number of factors that have influenced the growth of GDP and the economic development of the 6 WB and Croatia, while our paper summarizes these factors in only three of them. Secondly, the paper shows that the increase in public spending, in addition to affecting growth and economic development, also promotes the growth of production and exports according to economic fields and branches. Thirdly, corruption, wrongly perceived as influencing economic development, appears in our paper to negatively affect the productive public investments and shrink the activity of private investments in the economic development of a country. This paper also complements the existing literature by making a valuable contribution to the treatment of the phenomena that occurred in the 6 WB countries and Croatia during the 20-year time period of this study.

The following is the flow of work: An overview of the literature on the connection between government spending and GDP is presented in Section 2. The creation of hypotheses and their testing are discussed in Section 3. Sections 4 and 5 examine the methodology and data set, respectively, while the final section validates and draws a conclusion.

2. Literature and the Development of Hypotheses
2.1. Literature Review
In the Western Balkan countries, investments have played a pivotal role in augmenting the worth of fixed assets, encompassing land, buildings, vehicles, and machinery, all of which constitute focal points of state budget allocations. According to Prole and Petković (2021), these investments essentially represent the allocation of resources towards the public sector. Additionally, they produce both movable and immovable capital, which has a significant impact on businesses and the overall economy, as Facchini and Seghezza (2021). Through studies employing sophisticated methodologies like multivariable co-integration and variance decomposition over various time spans (specifically, 1975-1998, 1967-1998, and 1973-1998), it was observed that, in the short term, a discernible connection exists between government expenditures and economic growth. However, this relationship manifested as directly and persistently negative, as outlined in the research conducted byZouhar, Jellema, Lustig, Trabelsi, and Trabelsi0 (2021). This underscores the nuanced nature of the interplay between fiscal policies and economic development, emphasizing the need for judicious and strategic allocation of public resources for sustained prosperity.

The World Bank (2021) research exhaustively documents the subtle dynamics of total public spending in Western Balkan countries, revealing a substantial association between realism indicators and income sources throughout a certain fiscal cycle. Analysing the current costs of goods and services, which both the federal government and local governments bear, is crucial in this context. These costs, when calculated at current market values, are critical components in calculating any nation's Gross Domestic Product (GDP). Each country's economic strength and vitality determine the extent of their impact on GDP, highlighting the complex interaction between fiscal policy and economic performance in this region. This comprehensive understanding elucidates the strategic significance(Gramlich & Rubinfeld, 1982). The assessment of both the central government's and local governments' current accounts encompasses a comprehensive examination of expenditures and revenues for both the public and private sectors. According to study by Krajišnik et al. (2019), these financial activities have a direct impact on the general social welfare of the population. Notably, there has been a discernible upward trend in these accounts in recent years, demonstrating a commendable effort to operate within the confines of budgetary limits. This increase can be attributed to the inclusion of additional categories of beneficiaries from the state, whichIparraguirre (2020) highlights as a significant development in the social policy landscape. This expansion of coverage reflects a proactive approach towards enhancing the well-being of the populace, affirming the commitment to inclusive and sustainable social welfare measures.

As elucidated by Bartlett and Xhumari (2007), Western Balkan countries recorded an average budget deficit of 0.8% of their Gross Domestic Product (GDP), with public expenditure averaging at 38% of GDP. This fiscal landscape has consequently led to an elevation in capital transfers, which are essentially

disbursements from the central government to the local public sector acting as guarantors, as noted by Fetai, Bexheti, Alili-Sulejmani, and Ramadani (2021), in their study. It's worth noting that the sources of income for these transfers exhibited variability, strongly influenced by the economic performance of each individual country, a phenomenon highlighted in the research conducted.

This multifaceted dynamic underscores the paramount importance of ensuring that expenditures are not only efficient but also judiciously allocated to foster economic growth and enhance the social well-being of the populace, an imperative emphasized by Zhang, Xu, and Ding (2023). Even in the study of Badri, Badri, and Cham (2019), it concludes that increased use of research and development (R&D) will increase competition in manufacturing sectors, which will have a positive impact on the economy, improving product quality and diversity, and improving productivity, which will increase production itself". Costs and technological advances reduce costs, increase productivity, and increase exports. It is underlined that, in light of the pronounced and negative ramifications, government spending was proportionally modest in relation to actual economic growth. This intricate interplay between fiscal policy, economic performance, and their ultimate impact on public welfare demands a balanced and astute approach to financial management in the Western Balkan region.

Every sovereign state formulates its revenue collection and public spending strategies in accordance with budgetary regulations and the unique characteristics of its economy. In a general sense, the receipt of regular revenues is a recurring annual practice, projected through meticulous assessment of preceding periods and the anticipated trajectory of economic growth. This foresight is instrumental in safeguarding against unforeseen exigencies, including but not limited to natural disasters and epidemics, by ensuring a financial cushion for swift and effective responses. Such fiscal prudence not only fortifies a nation's resilience but also underscores the importance of strategic financial planning in mitigating the impact of unpredictable events on both the economy and the well-being of its citizens (Thapa, 2020).

Foreign direct investments have been highlighted as crucial for economic expansion, and as a result, public investments have also been made in Western Balkans countries (Indrajit et al., 2021). While FDI decisions were previously motivated by macroeconomic variables, it appears that investors' perspectives have shifted and they are increasingly considering regulatory and institutional policies. Even the researchers Krasniqi-Pervetica and Ahmeti (2022) confirm that the lack of data for WB has made the research work of time series difficult. Foreign direct investment increased as a result of policy changes, and doing business in the Western Balkans has varied from nation to nation (Prole & Petković, 2021).

According to Vu Le* and Suruga (2005), who proved in their work that the relationship between FDI expansion and economic growth is favorable, but at a certain level of public spending, the impacts of FDI become unstable, both in developed and developing nations. More and more governments use the World Bank's assessment of aspects of doing business as a basis for measuring regulatory policies for foreign investments. Several authors have addressed the relationship between economic expansion and corruption using the Corruption Perception Index (CPI), which measures corruption (Gründler & Potrafke, 2019).

2.2. Development of Hypotheses

Various studies have shown a link between government spending and economic growth, but this is highly dependent on other factors, as in the case of our study, which includes the main foreign investments and corruption levels in Western Balkan countries (Nuta, Nuta, Chirila, Roman, & Pusca, 2015). It can be seen in fiscal policy that their adaptation in low-income nations can have an impact on economic growth, as demonstrated by the Bandrés and Gadea (2019) study. Even so, according to Wagner's Law, economic and social growth, as well as government transfers, influence an increase in government activity and economic growth. The results of our research also support this.

Similarly, the economic growth effects of government spending were examined using disaggregated analysis based on sectoral spending, with VAR analysis for annual data for the endogenous model 1962-2007, and it was discovered that government spending on education has a positive effect on economic growth while having a negative effect on short-term spending, spending on agriculture has no effect on economic growth, and spending on defence and health has a negative impact on economic growth (Gupta & Shastri, 2020).

The relationship between monetary policy and world economic development from 1970 to 2005 using an error correction technique (Rajabi & Ebrahimi, 2020). He investigated the division of government spending and taxes and discovered that there was no evidence of the impact of distortionary taxation on economic growth, but there was a positive correlation between productive spending and economic growth, which (Gruber et al., 2021) supported. Some of the relevant studies that have been carried out so far, but not the only ones, have been observed in what has been mentioned above, which show different results regarding the analysis carried out for public expenditures and the impact on the Gross Domestic Product carried out for countries of different and different time periods.

Andrés-Rosales et al. (2021) investigated the relationship between long-run public spending, corruption, and economic growth and discovered that these three variables are connected. There are similarities in the definitions of the system and structure of public spending in modern nations, but also in Western Balkan republics. Public expenditures are classified in the budget system and fiscal policy based on the form and

organization of the state, as well as its functions. Different governments use the economic category according to the sectors that are primary for the functioning of a state and its constitutional mechanisms in the development of policies that result in the functioning of finances for better management of expenses in all categories of expenses (Divino, Maciel, & Sosa, 2020). The military, public safety, economic concerns, environmental protection, housing and community costs, health care costs, recreation, culture, and religious costs, educational costs, and social concerns account for the majority of general government service costs(Divino et al., 2020).

Western Balkan nations have used fiscal methods to influence population quality of life and economic activity levels. As a result, it is critical to investigate and appreciate how fiscal policy influences economic growth in the Western Balkans, particularly in light of the comparison with Central European states made in theNeycheva and Neychev (2020) study. What matters is that fiscal policies have played an essential role in regulating macroeconomic policies relating to the state budget and public spendingNeycheva and Neychev (2020).

Fiscal policy is vital to the conduct of economic indicators and the governance of economic growth and decline. The production of goods and services, rates of inflation and unemployment, balance of payments, and exchange rates have all been factors in the Western Balkan countries' attempts to achieve macroeconomic equilibrium. Endogenous growth theory found the elements that contribute to the most significant output variance caused by changes in production parameters. It highlighted how government spending, particularly on public infrastructure, leads to economic growth (Neog, 2019). He argued that government investment in infrastructure boosts private-sector productivity. As a result, the returns to scale rise over time, suggesting that they be funded through taxation. Long-term, it is a major issue in a country that uses public spending to impact GDP(Luintel, Matthews, Minford, Valentinyi, & Wang, 2020). In the near run, public expenditure that shapes economic behavior and policies that influence investments and consumption while also aiming to regulate the trade balance and payments can be a chance to raise GDP. Public expenditures have been influential in modifying salaries and prices during governance. At the same time, by tying together monetary and fiscal policy, the state budget, interest rates, and the degree of inflation.

When it comes to public expenditures, macroeconomic policy is primarily concerned with the Gross Domestic Product. The daily discussion of the topic of scientific research for macroeconomic policies based on indicators of production growth, as well as the finding of the relationship between them, contributes to scientific research(Chugunov, Pasichnyi, Koroviy, Kaneva, & Nikitishin, 2021).

The study used cross-sectional dependence to do panel unit root and panel cointegration tests. The results showed that there was no significant link in the long-run analysis. This shows that government spending has an effect on economic growth. Both public spending and inflation were found to have a beneficial influence on short-term economic growth(Ertekin & Bulut, 2021).

Srinivasan (2013) discovered a direct relationship between public spending and economic growth from 1973 to 2012, demonstrating that total public spending has a positive impact on economic growth, which Simiyu (2015) supported by evaluating the correlation of public spending and economic growth using the Granger causality test. According to the research, government spending boosts economic growth. An analysis of the long-term link between government expenditure and economic growth in Turkey from 1965 to 2000 using least squares results found that government spending had a beneficial effect on economic growth, according to Karagianni and Pempetzoglu (2009).

At the same time, the impact of increased government spending has produced varied outcomes, with positive and negative relationships. However, no studies have been conducted to date that examine these overlapping elements in specific periods such as the 2008/09 financial crisis, the COVID-19pandemic, and the post-COVID-19 period for WB nations.

As a result, public spending represents an outflow of money for goods and services in economic activity, and it is intended to empirically confirm that these expenditures have a positive or negative impact on GDP growth and that this relationship helps to improve the performance of economic activity (i.e., dependence on public spending). As a result of these data, we make the hypothesis that..."

Hypothesis 1: The increase in the gross domestic product is impacted by the rise in public spending.

Despite a large body of literature, the link between FDI, government spending, and economic growth has received little attention. The authors Rustamugli and Baxodirovna (2021), who looked at one of the most powerful economies in the world, Singapore supported Bougharriou, Benayed, and Gabsi (2019) important contribution by demonstrating that there is a positive correlation between FDI, government spending, and economic growth.

The findings of this analysis give persuasive evidence that there is no long-term or causal link between foreign direct investment, trade, and gross fixed capital formation(Yotzov, 2020). In theory, FDI is thought to have direct and indirect benefits for the economic growth of developing countries, and this has been empirically demonstrated in our study.

Increased FDI has directly helped Western Balkan countries in terms of capital growth, local production growth, competition, and exports. Furthermore, while some research indicates that foreign direct investments have a positive effect on the level of real GDP growth, many others do not. In general, FDI has had a favorable impact on the amount of exports and imports in Western Balkan countries, expressed as a

percentage of GDP, according to Qehaja, Zeka, and Hoti (2022). Similarly, no one can agree on the relationship between government spending and economic growth. Because it is an effective tool for increasing wealth in the national economy and the human community, FDI is the engine of economic progress and human development. This demonstrates that higher FDI is associated with it.

So, over time, FDI leads to significant changes in a country's level of living, in recent years, FDI has been directed toward a variety of businesses in Western Balkan countries, including car components, renewable energy, tourism, and technological services. However, they are regarded as restricted when compared to the index of FDI per capita in EU nations, as well as the ability to absorb investments from these countries, as well as other fast emerging countries(Cervantes, Dang, & Eapen, 2019).These countries receive half of the FDI per capita received by EU countries.

A significant increase in Foreign Direct Investment (FDI) results from favourable business climate variables, resulting in an increase in Gross Domestic Product (GDP). This idea is important for economic development since the presence of a suitable business environment, which includes ease of doing business and attractive tax regulations, can impact the attraction of foreign investments. It would imply an increase in Foreign Direct Investment (FDI) in a country's economy in this situation. Numerous studies have demonstrated that FDI may have a favourable impact on economic output since it introduces new technology and knowledge while also creating new job possibilities. Starting with the existing situation of WB nations and working backwards, some elements, such as the business climate and human resources at a young age, encourage an increase in FDI and can have a beneficial effect on GDP growth. The goal of this study is to show how they are related. Then As a result, we propose that the following hypotheses be investigated:

Hypothesis 2: With the increase in FDI as a result of the factors of doing business, the gross domestic product also increased.

3. Research Methodology

3.1. Sample and Data

The methodology used in this study is based on a detailed economic examination of public expenditure and its impact on Gross Domestic Product (GDP) for the Western Balkan countries (WB6), as well as Croatia, during a two-decade period (2002-2021). Data was gathered from reputable institutions such as the World Bank, the International Monetary Fund, and the respective statistical offices of the countries under consideration, as well as primary sources and reports on financial statements released by the Finance Ministers of each WB6 member country, plus Croatia.

This article investigates two hypotheses, thoroughly evaluating the impact of government spending on GDP growth and the impact of Foreign Direct Investment (FDI) coming from business-related factors on GDP growth(Bajra et al., 2020).

Furthermore, the report shows that the WB6 nations have increased their efforts to strengthen the research and innovation industry by modifying strategic approaches, regulatory frameworks, and action plans. This shift aims to change the existing performance orientation of legal frameworks so that they are more closely aligned with EU standards, with the ultimate goal of improving their impact on education and the economy(Toader, Firtescu, Roman, & Anton, 2018).

Using descriptive and comparative statistics, as well as the econometric method and the World Governance Indicators (WGI) as a study dataset, this research compiles diverse opinions on governance effectiveness from a wide range of stakeholders in both developed and developing countries. These perspectives are methodically gathered from a wide range of survey organizations, research organizations, non-governmental organizations, worldwide institutions, and private sector firms.

Furthermore, cash payments are made for the government's operational activities in the supply of goods and services, according to the World Bank Expenditure Reports (World Bank, 2021). These expenditures include employee remuneration (such as wages and salaries), interest and subsidies, grants, social benefits, and other costs such as rent and dividends. Furthermore, foreign direct investment (FDI) is defined as a net investment made to secure a consistent controlling position (10% or more of the voting shares) in a company functioning in an economic context different from the investor's. This includes equity capital, earnings reinvestment, other long-term capital, and short-term capital in terms of the balance of payments.

This stringent methodology is used to ensure that the data derived from qualitative research is objective, with findings being generalized and meticulously administered and exhibiting a real-choice level of reliability exceeding 95%, as determined by multiple linear regression (OLS).

3.2. Measurement of Variables

This article employs the dependent variable, in this case GDP, and the independent variables, which are Public Expenditures, Foreign Direct Investment, and Evaluation of Governance or Corruption as factors in GDP. In the instance of our study, the dependent variable is GDP growth over a twenty-year test period for the economies of the seven countries, which is also used byAndrean and Sari (2020). Based on statistical data on public spending and foreign direct investments and the assessment of governance or corruptions a control variable as a component of GDP from 2002 to 2021. The impact on GDP was investigated utilizing general

expenses realized over this period as the independent variable and Gross Domestic Product realized for the period 2002-2021 as the dependent variable.

3.3. Model

Many scientists in economics, finance, microeconomics, macroeconomics, agricultural economics, labor economics, family economics, education, and health rely on econometric models(Bajra et al., 2020). The findings of these models enable the use of dynamic data for comparison study over multiple periods and years, with implications for the economy and other areas. The use of the Ordinary Least Squares (OLS) econometric model allows for the control of factors that are fundamentally difficult to assess using traditional and simpler methods(Ertekin & Bulut, 2021).

In our specific case study, the evaluation of the impact of public spending, foreign investments to GDP from 2002 to 2021 remains relevant, particularly for the economies of seven WB6 countries, including Croatia. This method is used to handle the subjective aspect of qualitative research data, guaranteeing that the findings are generalized, methodically administered, and have a genuine choice level of reliability more than 95%. As a result, the regression analysis testing in this study will be carried out using the equation model shown below.

$$y\ (GDP\ growth)\ t\ = b_0 + b_1\ Pe + b_2\ FDI + b_3\ Corr + e_i \qquad (1)$$

Where y represents gross domestic product (GDP), Pe represents public expenditure, FDI represents Foreign Direct Investments, and Corruption represents the level of corruption in the country over time. Variables have been determined based on multiple regression for the findings that we will receive based on econometric calculations using the fixed effects model(Talen & Anselin, 2021). In the first case, we have public spending as a proportion of total GDP and economic growth for the economies of the seven Western Balkan countries from 2002 to 2021. In the second case, we have FDI realized for the economies of seven Western Balkans countries from 2002 to 2021, with an influence on GDP, while the variable control Evaluation of governance as a factor in the Gross Domestic Product (GDP)

During the study period, data was collected on an annual basis. A similar strategy of data collection is possible and has been used in the authors' investigations and other scientific studies. All independent variables show their percentage contribution to the Gross Domestic Product. Through the use of moderating variables, regression analysis with moderating variables constructs the relationship model as it is used in the work ofWeigel (2020). The moderator variable acts as a factor that influences how strongly or weakly the dependent and independent variables are associated.

4. Conclusions Results

4.1. Descriptive Statistics

Table 1 displays the descriptive statistics for the factors examined in this study. For the economy of seven Western Balkans countries from 2002 to 2021, all variables are shown on an annual basis. In relation to GDP, Public Expenditures were 9.50 points on average, 8.79 points at the low end, and 10.45 points at the high end. Public Expenditures were 9.5 billion euros on average for the 20-year period, with a top value of 10.45 billion euros and a minimum value of 8.79 billion euros. While the descriptive statistics for Foreign Direct Investments are present. Since the average was 8.80 points, the lowest value was 7.73 points, and the highest value was 9.66 points in proportion to GDP. Foreign Direct Investments averaged 8.80 billion euros for the 20-year period, with a maximum value of 9.66 billion euros and a minimum value of 7.73 billion euros. While factors for evaluating governance or corruption are included, descriptive statistics are not. Since the average was 10.01 points, and the lowest and highest numbers were 1 and 15, respectively, in relation to GDP.

The linear regression formula Y (GDP growth), *t=b0+b1Pe+b2FDI+b3Corr+ei*, was used to analyses the value of the standard deviation, and according to this, the independent variables public spending, FDI, and evaluation of governance have influenced GDP growth, showing a factual and significant correlation between them, showing a correlation of real growth. This is stated using the standard deviation in positive values, as shown in Table 1:

Table 1. Descriptive statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Id	140	4	2.007	1	7
GDP1	140	10.108	0.414	9.41	10.85
Pe2	140	9.500	0.377	8.79	10.45
FDI2	140	8.809	0.400	7.73	9.66
Corr_sco	140	10.014	2.960	1	15
Corr_rank	140	44.376	11.000	22.92	69.69

4.2. Model Testing

Model Evaluation and Diagnosis: Before proceeding with result interpretation, it is critical to run a battery of diagnostic tests related to model validation, with a special emphasis on variable application. We ensured that critical econometric and statistical assumptions were followed when developing an economic

panel regression model. We also conducted important diagnostic assessments for two critical phenomena: multicollinearity and heteroskedasticity.

High correlations among independent variables cause multicollinearity, a major problem in regression analysis. We give the correlation matrix with the dependent variables to address this issue. This is critical because multicollinearity is inextricably tied to the interdependence of the independent variables.

Table 2: Multicollinearity Evaluation: This table presents a complete summary of the correlation patterns between the dependent variables, providing significant insights into potential relationships.

Table 2. Multicollenrarity.

Variable	VIF	1/VIF
Pe2	1.64	0.609
Corr_sco	1.51	0.663
FDI2	1.44	0.692
Mean VIF	1.53	

Table 3. Pearson corelation metric.

	Gdp1	Pe2	FDI2	Corr_sco
Gdp1	1			
Pe2	0.808	1		
FDI2	0.669	0.517	1	
Corr_sco	0.686	0.546	0.449	1

The Pearson correlation metric is used in Table 3 to give a scientific evaluation of the model used in this investigation. Because government spending has an impact on GDP growth, the VIF test produces a value of 0.609308, suggesting a substantial relationship between government spending and GDP. Similarly, there are clear indications of a correlation with the GDP variable in the case of Foreign Direct Investment (FDI), as indicated by theVariance Inflation Factor (VIF) test result of 0.692821. Additionally, a VIF test result of 0.663378 indicates a correlation with the GDP variable in the assessment of governance or corruption. These data support the initial hypothesis proposed in this study.

Table 4. Fixed effects regression regression analysis.

Fixed effects regression model. GDP growth is the dependent variable in the case here

Variables	(1)
	Gdp1
Pe2	0.736***
	(0.0278)
FDI2	0.0589***
	(0.0117)
Corr_sco	0.00484***
	(0.00148)
Constant	2,550***
	(0.257)
Observations	140
Number of id	7
R-squared	0.910

Note: Standard errors in parentheses.
*** $p < 0.01$.

Table 4 displays the results of the regression analysis, providing a scientific assessment of the factors' impact on GDP. The model emphasizes that government expenditure has a significant and direct influence on GDP growth, as indicated by the significant coefficient of 0.736***. This supports Hypothesis 1: an increase in government spending has an impact on the gross domestic product.

In addition, the regression analysis sheds light on the impact of foreign direct investments (FDI) on GDP. The notable coefficient 0.0589*** in the statistically examined model unambiguously shows how FDI has a direct and significant impact on GDP growth. This confirms the correctness of Hypothesis 2: With an increase in FDI as a result of business-related factors. Furthermore, the judgment of governance fits with the GDP variable's aesthetic standards. The regression analysis insights are critical to reaching the objectives and goals specified in the paper's study agenda.

The second set of figures represents the standard deviation result. The result, in this case, would be approximately 0.0278. This means that, on average, each data point in your set deviates from the mean by approximately 0.0278 units, indicating the spread or dispersion of the data points around the mean. The

resulting value of 0.0117 would then represent the standard deviation for that particular data set. In this case, the small value of 0.00148 suggests that the data points are closely packed around the mean, indicating a low level of variability or dispersion in the data set.

5. Conclusions and Findings

This study systematically analyzed the impact of government spending on GDP growth, using data from seven countries, including six Western Balkan republics and Croatia, from 2002 to 2021. While earlier research has touched on this problem in a variety of nations and periods, our study adds to the current knowledge by focusing on individual case studies in the chosen countries. This technique is consistent with the expanding trend of using individual and social studies to investigate alternatives, which is supported by rigorous analysis and empirical data. Our research is based on the assumption that there is a causal relationship between public spending and GDP growth, as well as FDI and GDP growth.

The economic growth and development of the WB6 nations and Croatia, as well as consumption and other economic indicators, form an integrated system that is subject to a number of influences. This emphasizes the significance of taking a planned approach to public spending while also being aware of the hazards involved.

The findings of this study are directly related to the stated goals and objectives of the publication. By utilizing the OLS econometric model of multiple linear regressions and the STATA application, we were able to effectively measure variables that are fundamentally difficult to quantify using conventional methods. This enabled us to examine the impact of public spending and FDI on GDP throughout the selected period of 2002-2021, as well as the impact of governance.

Numerous statistical forms have shown through variable testing that, over time, the growth of government has a direct and indirect impact on GDP growth. The independent variables studied in this study were Public Expenditure and FDI, while the dependent variable was GDP. The results shown in the tables are an essential component of the study's conclusions. Using standard deviation, median, and linear regression formulas, we discovered that certain independent factors have a uniform influence on GDP growth, while others have a considerable influence on real growth.

The correlation matrix was used to determine the impact of government spending on GDP for six Western Balkan countries, including Croatia, which served as an independent and significant variable in this study. Our findings confirm economic theories that argue that increasing government spending leads to increased GDP. The use of linear regression to analyses the effects of independent variables on GDP over time verified the hypotheses of this study. Our findings confirm that the independent variable of Public Expenditure has a large and positive impact on GDP growth. These findings are consistent with those of other scholars and researchers who have investigated similar topics.

Linear regression is used in the chosen model to look at the effects of the independent variable (Y) once a year in order to find the link between the quantitative factors (X) and their effect on GDP. To validate Hypothesis H1, the OLS model was used, using GDP as the dependent variable and FDI and public expenditure as independent variables. The analysis revealed that Public Expenditure has a favourable impact on GDP growth.

Furthermore, *Hypothesis H2* has been confirmed using the OLS model: the elements involved in conducting business have resulted in an increase in FDI, hence pushing up GDP. The information in Table 3, which shows economic patterns, supports this second premise. Notably, these developments have had an effect.

The link between the quantitative parameters (X) and their impact on GDP is investigated using linear regression to examine the effects of the independent variables (Y) across time. According to this study, the linear regression formula Y (GDP growth) $t=b_0+b_1Pe+b_2FDI+b_3Corr+e_i$ shows that the growth of FDI has a direct impact on GDP growth. We discovered that independent factors play a substantial role in driving GDP growth by using standard deviation and median values.

Our approach has limitations, just like any other study. One specific constraint is variable measurement, which is dependent on the available time series and general data backing this study. This limitation is in addition to the usual limits associated with primary and secondary data studies. As our research shows, public investment in the Western Balkans has historically been disregarded. As a result, it has become critical to investigate how public spending and FDI affect GDP, a gap in the literature that our research tries to fill.

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