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THE IMPACT OF BUSINESS, ADMINISTRATIVE AND MACROECONOMIC FACTORS ON GDP GROWTH IN THE WESTERN BALKAN COUNTRIES: A PANEL DATA ANALYSIS

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Abstract: *This study examines the impact of business, administrative, and macroeconomic factors on GDP growth in Western Balkan economies that are not members of the European Union. The analysis covers the period 2010–2024 and uses labor productivity, industrial value added, domestic credit to the private sector, and foreign direct investment as explanatory variables, while inflation and unemployment are included as control variables.*

The empirical analysis is based on a fixed-effects panel model that controls for unobserved country-specific heterogeneity. The results reported in Table 3 show that none of the explanatory or control variables reaches conventional levels of statistical significance in the estimated specification, although several coefficients display directions that are broadly comparable with selected theoretical expectations. These findings suggest that GDP growth in the observed countries may depend on a broader set of structural and institutional determinants beyond the variables included in the present model. Accordingly, the study points to the importance of cautious interpretation and of further model refinement in future research.

Keywords: GDP growth, business and administrative environment, foreign direct investment, macroeconomic stability, panel data analysis

JEL classification: C1, C23, E2, E3, E6

INTRODUCTION

The structure and value of GDP represent a key objective of every socio-economic community.

When GDP is promoted for the purpose of development, it is assumed that its optimal composition affects all aspects of the socio-economic life of the community we are observing. The complexity of the structure, shape and degree of influence of the factors that determine the economic outcome of activities in a given area requires a subtle but professional approach that can identify factors in terms of their size, shape and extent of influence on GDP growth in the Western Balkan countries that are not members of the European Union, among which Bosnia and Herzegovina and Serbia – of course – stand out as the central focus of the authors of this study.

The aim of the research was to examine and empirically verify the effects of a selected set of independent and control variables within a defined temporal and territorial framework on GDP as the dependent variable.

In this sense, a set of factors from the above-mentioned domain was selected, including:

- Economic superiority, as an internal factor, expressed through the productivity of the working population and the value of production, and the contribution of business administration, as an external factor, which includes the availability of domestic loans to business entities and foreign direct investment, as independent variables.
- Macroeconomic stability, which includes the dynamics of unemployment and inflation and is set as a control variable in the research.
- The time period of the last fifteen years, i.e. from 2010 to 2024.
- Territorial coverage of the Western Balkan countries that are not members of the European Union (Albania, Bosnia and Herzegovina, Montenegro, Serbia and North Macedonia – due to their geographical proximity, market interconnectedness and position in the international economic environment).

The achievement of the objectives of the research project is assessed through the formulation and testing of research hypotheses.

- H1: Higher labor productivity has a statistically significant positive effect on GDP per capita growth.
- H2: Higher availability of domestic credit resources has a positive effect on economic performance.
- H3: Macroeconomic stability has a positive effect on economic growth.

The research project includes defining variables, collecting statistical data, constructing and testing models, as well as interpreting the results and assessing their practical and theoretical significance.

The selected theoretical model that adequately addresses the chosen topic and answers the research questions proposed within the project is the panel data analysis model, which has the capacity to meet the stated requirements.

LITERATURE REVIEW

The econometric procedure implies the quantification of business process factors at both the micro and macro levels, in order to understand the consequences of business decisions prior to their implementation, which is highly useful for small and especially for large business systems. When the term ‘business system’ is used to denote a socioeconomic community, the analysis concerns larger systems; however, with

appropriate adaptation, such modelling remains applicable and meaningful at the micro level as well as at the macro level.

In this regard, several studies based on business system modelling may be highlighted, including those that address:

- Forecasting actual demand in the service sector using simulation models
- The contribution of higher education investment to GDP growth in Western Balkan countries, assessed through panel data analysis.
- Selection of investment alternatives under conditions of risk using regression analysis models and under conditions of uncertainty using models from the field of matrix games.
- Selection of investment policy under conditions of uncertainty as a strategic commitment for entering foreign markets using matrix game theory.

A research approach based on relevant data sources and adequate econometric analysis provides clear and highly applicable guidelines for proactive action supported by verified hypotheses within the context of the specifically selected research project. Professor Fisher S. was among the pioneers who began exploring the topic of macroeconomic stability and growth theory. In his work *Macroeconomic Stability and Growth*, he investigates and ultimately demonstrates that macroeconomic stability, viewed through the lens of low inflation, stable fiscal policy, and the avoidance of balance-of-payments crises, significantly contributes to long-term growth. Davoodi H. and Montiel P. emphasize that macroeconomic policies, particularly monetary and fiscal policy, directly influence growth and stability. In their work *Macroeconomic Stability and Inclusive Growth*, they recommend avoiding procyclical policies in order to maintain stability. In addition to the previously mentioned distinguished scholars, numerous other researchers have examined the topic of macroeconomic stability and its impact on GDP growth. Among them, particular emphasis should be placed on Le Fort Varela, G., Gallardo, B., and Bustamante, F., who use panel regression models (1980–2015) and show that:

- Inflation has a negative impact on growth.
- There are inflation thresholds beyond which the negative effect becomes even stronger.
- Macroeconomic volatility (inflation, current account volatility) reduces the trend of GDP growth.

In addition to macroeconomic stability, numerous scholars have also examined the impact of productivity on macroeconomic growth, particularly GDP growth. Noteworthy contributions include those by Weinstock, L. R., and Korkmaz, S., & Korkmaz, O. In his scientific work *Productivity Growth: Trends and Policy Issues*, Weinstock, L. R. emphasizes that productivity represents the most important determinant of long-term economic growth, as increases in labor efficiency directly influence the growth of overall economic output and the standard of living. Korkmaz, S., & Korkmaz state that an increase in the productivity of production factors enables higher levels of output and economic growth, with human capital, technological progress, and economies of scale representing key determinants of productivity growth. Kharel, K. R., Poudel, O., Upadhyaya, Y., and Nepal, P., in their work *Effect of Private Sector Credit on Economic Growth in Nepal*, emphasize that credit to the private sector plays a key role in stimulating economic growth, as it increases investment capacity and encourages the long-term expansion of economic activity.

In a Western Balkan panel setting, Smolo (2021) reports that foreign direct investment may exert a negative effect on growth, while interaction terms between FDI and institutional development become statistically insignificant, suggesting that the growth effects of foreign capital in the region are not necessarily positive or stable.

Similarly, Iliuta and Ram (2005) emphasize that, in transition economies, the estimated effects of foreign direct investment are highly heterogeneous across countries, making it methodologically risky to formulate a single general conclusion about its growth contribution.

Recent evidence for the Western Balkans also points to unexpected interactions between foreign direct investment and institutional quality, indicating that the growth implications of FDI may depend on the broader regulatory and governance context rather than on capital inflows alone.

CONCEPTUAL AND THEORETICAL APPROACHES TO DETERMINING GDP GROWTH

Macroeconomic growth represents one of the key objectives of modern economies, as it reflects a society's ability to increase the volume of production, improve efficiency, raise the standard of living, and achieve long-term stability. Economic growth implies a continuous increase in the production of goods and services within a country, that is, an increase in GDP compared with the previous period (Savić, 2025). Within modern theoretical approaches, GDP growth is viewed as the result of the interaction of several factors, among which labor productivity, investment activity, the availability of financial resources, and the institutional environment stand out. All these components jointly determine the dynamics of overall economic activity and the ability of the economy to respond to market challenges.

Traditional growth models, such as Solow's neoclassical model, are based on the assumption that economic growth relies on capital accumulation, labor force expansion, and technological progress. Technological progress, as an exogenous factor, represents a key component that enables long-term GDP growth without a proportional increase in inputs. The role of productivity is particularly emphasized in modern endogenous growth theories, which highlight that innovation, knowledge, and investment in human capital generate sustainable growth from within internal economic processes.

Aside from productivity, investment activity holds a central place in determining overall economic output. Investments in infrastructure, capital goods, technology, and innovation expand the productive capacities of the economy and increase potential GDP. Their dynamics depend on macroeconomic conditions, interest rate levels, expected rates of return, and the degree of stability of the financial system. The role of financial intermediation in determining GDP growth is particularly emphasized through the credit channel. The only factor that has a positive and statistically significant effect on GDP per capita growth is credit granted to the private sector. For this reason, the availability of financial resources – particularly credit to the private sector – is considered one of the most important drivers of economic growth.

A stable financial system enables the efficient redirection of savings into investments, which opens up space for the development of entrepreneurship, the modernization of industry, and the improvement of competitiveness (Milosavljević, 2025). Credit expansion in the economy acts as a growth multiplier, as it provides firms with funds

for expanding production, innovating, and increasing employment.

Macroeconomic stability is the broader framework within which productivity, investment, and financial flows can achieve their full effect. Stable inflation, sustainable public finances, balanced fiscal policy, low unemployment, and cheaper labor create the prerequisites for a secure and predictable business environment (Milisavljević, 2018). Conversely, high inflation increases uncertainty, reduces the real return on investments, and discourages investment activity, while high unemployment diminishes aggregate demand and slows economic growth.

Modern institutional and administrative approaches to growth further emphasize the importance of efficient institutions, regulatory stability, transparency, and the quality of public administration. Institutional factors influence the speed of decision making, the level of legal certainty, the efficiency of resource management, and the attractiveness of the economy to both domestic and foreign investors. In the Western Balkan countries, institutional modernization has increasingly gained importance in the processes of strengthening economic stability and accelerating GDP growth.

In line with the aforementioned theoretical foundations, it can be concluded that determining GDP growth requires an integrated consideration of a range of economic, structural, and institutional factors. The combination of productivity, investment activity, financial accessibility, and macroeconomic stability forms the basis for long-term sustainable growth, while institutional advancement enables these factors to achieve their maximum effect in the real economic environment.

METHODOLOGY

The empirical strategy is based on a country-year panel covering five Western Balkan economies that are not members of the European Union—Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia—over the period 2010–2024. The panel structure allows the analysis to combine cross-country and intertemporal variation and is therefore appropriate for examining how selected business, administrative, and macroeconomic indicators are associated with GDP growth over time. Because the available dataset contains two missing observations for North Macedonia in the series Domestic credit to private sector (% of GDP), specifically for 2010 and 2011, the empirical sample should be treated as a slightly unbalanced panel rather than a perfectly balanced one.

- descriptive statistics for all variables,
- pairwise pearson correlations as an initial indication of linear association, and
- a fixed-effects panel specification as the baseline empirical model.

Descriptive statistics are used to summarize the central tendency and dispersion of the variables, while the correlation matrix is reported only as a preliminary diagnostic aid. Correlation coefficients should not be interpreted as evidence of causality, nor do they by themselves provide a sufficient basis for ruling out multicollinearity in the regression framework.

Panel analysis is particularly suitable in this context because it permits the simultaneous use of cross-sectional units (countries) and repeated annual observations, thereby reducing the informational limitations of purely cross-sectional or purely time-series approaches.

In the present study, the time dimension is annual, which is consistent with the reporting frequency of the selected macroeconomic indicators in the World Bank database. The cross-sectional dimension consists of the five observed countries. Accordingly, the dataset follows the same units across multiple years, which corresponds to the standard structure of macro-level panel data, although not every variable is observed for every country-year combination. The current specification includes country fixed effects only and does not include separate time fixed effects.

The general form of the panel data model can be symbolically expressed by the following equation:

Formula 1. General panel data model

$$y_{it} = \alpha_i + \sum_{k=1}^K \beta_k x_{kit} + \varepsilon_{it}$$

Source: Authors' own elaboration

- N denotes the number of cross-sectional units, and T denotes the number of time periods;
- Y_{it} represents the value of the dependent variable for the i th cross-sectional unit at time t ;
- X_{kit} represents the value of the k th independent variable for the i th cross-sectional unit at time t ;
- α_i denotes the intercept term specific to the i -th cross-sectional unit;
- β_k denotes the coefficient of the k -th independent variable, assumed to be constant across units and time;
- ε_{it} represents the stochastic error term of the model.

It represents the stochastic error term of the model and captures unexplained variation in the dependent variable, under the standard assumption that its expected value equals zero.

The panel data model assumes that each observational unit exhibits a different response of the dependent variable to the individual or joint effects of the independent variables, and that these differences may also vary across different time periods.

Among alternative panel specifications, this study uses a fixed-effects model as the baseline specification. The main reason for this choice is that the countries included in the sample differ in structural, institutional, historical, and policy-related characteristics that are difficult to observe directly but may influence GDP growth and remain relatively stable over time. A fixed-effects specification is appropriate when such unobserved country-specific heterogeneity must be controlled for through country-specific intercepts.

Formula 2. Fixed-effects panel model

$$y_{it} = \alpha + \mu_i + \sum_{k=1}^K \beta_k x_{kit} + \varepsilon_{it}$$

Source: Authors' own elaboration

At the same time, the fixed-effects specification in the present version of the paper should be interpreted as an initial empirical framework rather than as a fully exhausted model-selection result. Additional post-estimation diagnostics—such as a

formal fixed-effects versus random-effects comparison (for example, a Hausman-type test), heteroskedasticity checks, serial-correlation diagnostics, and cross-sectional dependence tests—are not reported in the current version and therefore remain an important direction for model refinement. However, multicollinearity was examined through an auxiliary variance inflation factor (VIF) diagnostic, which did not indicate severe collinearity among the explanatory variables.

The dependent variable is GDP growth (annual %). The explanatory variables are labor productivity, industrial value added, domestic credit to the private sector, and foreign direct investment, while inflation and unemployment are included as control variables. In substantive terms, the coefficients indicate the within-country association between changes in the explanatory variables and changes in GDP growth over time, conditional on time-invariant country-specific effects.

Formula 3. Empirical specification of the fixed-effects panel model

$$\text{GDPgrowth}_{it} = \alpha + \mu_i + \beta_1 \text{Productivity}_{it} + \beta_2 \text{IndustryVA}_{it} + \beta_3 \text{Credit}_{it} + \beta_4 \text{FDI}_{it} + \beta_5 \text{Inflation}_{it} + \beta_6 \text{Unemployment}_{it} + \varepsilon_{it}$$

$$\text{GDP}_{it} = \alpha + \beta_1 \text{Productivity}_{it} + \beta_2 \text{IndustryVA}_{it} + \beta_3 \text{Credit}_{it} + \beta_4 \text{FDI}_{it} + \beta_5 \text{Controls}_{it} + \varepsilon_{it}$$

Source: Authors' own elaboration

The empirical calculations reported in this version of the paper were organized in Microsoft Excel and estimated in IBM SPSS Statistics 22. In practical terms, the fixed-effects structure was implemented through country-specific intercepts that allow the model to control for time-invariant differences across the observed countries. This software setup was sufficient for descriptive statistics, correlation analysis, and base-line coefficient estimation, but it also limits the range of panel-specific post-estimation diagnostics that can be presented in the current version.

DATA

The empirical analysis relies on secondary data retrieved from the World Bank's World Development Indicators database. The sample includes five Western Balkan countries that are not members of the European Union—Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia—for the period 2010–2024. Variable selection was guided by the theoretical framework of the study and by the availability of internationally comparable annual indicators. The dataset is nearly complete, with the only identified missing observations referring to North Macedonia in the series Domestic credit to private sector (% of GDP) for the years 2010 and 2011.

- **Countries:** Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia
- **Period:** annual data, 2010–2024
- **Dependent variable:** GDP growth (annual %) — World Bank indicator code NY.GDP.MKTP.KD.ZG
- **Main explanatory variables:** labor productivity measured as GDP per person employed (constant 2021 PPP \$) — SL.GDP.PCAP.EM.KD; industry (including construction), value added (% of GDP) — NV.IND.TOTL.ZS; domestic credit to private sector (% of GDP) — FS.AST.PRVT.GD.ZS;

and foreign direct investment, net inflows (% of GDP) — BX.KLT.DINV.WD.GD.ZS

- **Control variables:** inflation, consumer prices (annual %)—FP.CPI.TOTL.ZG; and unemployment, total (% of total labor force) (national estimate)—SL.UEM.TOTL.NE.ZS

All variables are used in their annual levels or annual percentage forms exactly as reported in the World Bank database. No logarithmic transformation, differencing, standardization, rebasing, or additional rescaling was applied by the authors after data retrieval. Accordingly, the regression coefficients should be interpreted in the original units of the respective indicators. Labor productivity is operationalized through GDP per person employed and is therefore treated as a proxy for output per worker. Industrial value added, domestic credit, and foreign direct investment are expressed as percentages of GDP, while inflation and unemployment are expressed as annual percentages in their original reported form.

In principle, the intended design corresponds to 75 country-year observations (5 countries $\times$ 15 years). For six variables, the dataset contains the full 75 observations. The only exception is Domestic credit to private sector (% of GDP), for which two observations are missing for North Macedonia (2010 and 2011), leaving 73 valid observations for that series. In the descriptive statistics, correlations, and model estimation, all available observations were retained, so the analysis is based on a slightly unbalanced panel rather than on an artificially completed dataset. No interpolation or imputation procedure was applied to replace the missing values. Since the period under study includes the COVID-19 shock, the years 2020 and 2021 may contain exceptional macroeconomic disturbances; these observations are retained in the baseline sample in order to preserve the continuity of the observed macroeconomic trajectory, but they must be interpreted with caution and should be re-examined in a robustness analysis.

RESULTS

The structure of the empirical data can be illustrated by the following table.

Table 1. Descriptive Statistics

	GDP growth	Inflation	Industry	Domestic credit	FDI	Unemployment	GDP per person
Valid	75	75	75	73	75	75	75

Source: Authors (2025).

Table 1. presents the descriptive statistics for all variables included in the empirical analysis. The dataset contains 75 country-year observations for six variables, while the domestic credit variable contains 73 valid observations due to two missing values for North Macedonia in 2010 and 2011. Therefore, the panel is only slightly unbalanced.

Table 2. The correlation matrix

		GDP growth (annual %)	Inflation, consumer prices (annual %)	Industry (including construction), value added (% of GDP)	Domestic credit to private sector (% of GDP)	Foreign direct investment, net inflows (% of GDP)	Unemployment, total (% of total labor force) (national estimate)	GDP per person employed (constant 2021 PPP \$)
GDP growth (annual %)	Pearson Correlation	1	0.151	-0.126	-0.163	0.084	-0.187	0.152
	Sig. (2-tailed)		0.197	0.280	0.164	0.474	0.107	0.192
	N	75	75	75	73	75	75	75
Inflation, consumer prices (annual %)	Pearson Correlation		1	0.072	-0.189	0.115	-0.255*	0.242*
	Sig. (2-tailed)			0.538	0.105	0.324	0.027	0.037
	N		75	75	73	75	75	75
Industry (including construction), value added (% of GDP)	Pearson Correlation			1	-0.249*	-0.506**	0.002	-0.643**
	Sig. (2-tailed)				0.031	0.000	0.988	0.000
	N			75	75	75	75	75
Domestic credit to private sector (% of GDP)	Pearson Correlation				1	-0.033	0.153	0.156
	Sig. (2-tailed)					0.777	0.190	0.182
	N				73	73	73	73
Foreign direct investment, net inflows (% of GDP)	Pearson Correlation					1	-0.275*	0.222
	Sig. (2-tailed)						0.017	0.055
	N					75	75	75
Unemployment, total (% of total labor force) (national estimate)	Pearson Correlation						1	-0.055
	Sig. (2-tailed)							0.638
	N						75	75
GDP per person employed (constant 2021 PPP \$)	Pearson Correlation							1
	Sig. (2-tailed)							
	N							75

Source: Authors (2025).

Note: Table 2. reports pairwise Pearson correlations among the variables included in the empirical analysis. Most coefficients are low to moderate in magnitude, suggesting no severe bivariate association among the explanatory variables. Several statistically significant correlations are observed, particularly those involving industrial value added, inflation, unemployment, and labor productivity; however, these coefficients should be interpreted only as preliminary descriptive evidence rather than as proof of causal or structural relationships. Because the domestic credit series contains two missing observations for North Macedonia in 2010 and 2011, every correlation involving that variable is based on 73 valid observations, whereas all remaining correlations are based on 75 observations. This conclusion is further supported by the variance inflation factor (VIF) diagnostic, which confirms the absence of severe multicollinearity among the explanatory variables.

Table 3. Fixed-Effects Panel Model Estimates

Parameter	Estimate	Std. Error	df	T	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	9.171938	6.714474	68.000	1.366	0.176	-4.226586	22.570462
Inflation, consumer prices (annual %)	0.082276	0.123876	68.000	0.664	0.509	-0.164915	0.329466
Industry (including construction), value added (% of GDP),	-0.159907	0.164558	68	-0.972	0.335	-0.488278	,168465
Domestic credit to private sector (% of GDP)	-0.051781	0.035700	68.000	-1.450	0.152	-0.123020	0.019457
Foreign direct investment, net inflows (% of GDP)	-.073523	,135267	68.000	-0.544	0.589	-0.343444	0.196398
Unemployment, total (% of total labor force) (national estimate)	0.000015	0.000051	6,000	0.286	0.775	-0.000088	0.000117
GDP per person employed (constant 2021 PPP \$)	-0.074414	0.059355	68.000	-1,254	0.214	-0.192855	0.044027

Source: Authors (2025).

Note: The estimates reported in Table 3 are based on the baseline fixed-effects panel specification. The dependent variable is GDP growth (annual %). Due to two missing observations for North Macedonia in the domestic credit series (2010 and 2011), the estimation is based on a slightly unbalanced panel. None of the explanatory or control variables reaches conventional levels of statistical significance in the present specification.

The explicit specification of the panel data model can be expressed by the following equation:

Additional robustness check excluding the COVID-19 years

As a basic robustness check, the model was re-estimated after excluding the COVID-19 years 2020 and 2021. The reduced sample includes 63 valid country-year observations because the two missing values for North Macedonia in the domestic credit series (2010 and 2011) remain excluded from the estimation. The purpose of this re-estimation is to assess whether the baseline findings are driven primarily by the exceptional macroeconomic disturbances associated with the pandemic period.

Table 3a. Robustness Check: Fixed-Effects-Type Re-estimation Excluding 2020 and 2021

Parameter	Estimate	Std. Error	t	p-value	Lower 95%	Upper 95%
Intercept	9.667247	3.185379	3.034882	0.003646	3.286167	16.048327
Inflation	-0.032243	0.058470	-0.551444	0.583523	-0.149372	0.084886
Industry	-0.164921	0.073344	-2.248584	0.028492	-0.311848	-0.017995
Domestic credit	-0.009627	0.032397	-0.297154	0.767449	-0.074526	0.055272
FDI	-0.118444	0.067298	-1.759981	0.083872	-0.253258	0.016371
Unemployment	-0.149002	0.045411	-3.281226	0.001782	-0.239971	-0.058034
GDP per person employed	0.000013	0.000026	0.489961	0.626075	-0.000039	0.000064

Source: Authors (2025).

Note: In the reduced sample, the overall pattern of results remains broadly cautious, since domestic credit, inflation, and GDP per person employed remain statistically insignificant. However, the exclusion of 2020 and 2021 produces two notable changes: industry becomes statistically significant with a negative coefficient, and unemployment becomes statistically significant with a negative coefficient, while FDI remains negative and only marginally close to conventional significance levels. This suggests that the insignificance of the baseline model is not explained solely by the COVID-19 years, but it also indicates that coefficient sensitivity to sample composition should be acknowledged when interpreting the findings.

Auxiliary multicollinearity diagnostic

As an auxiliary diagnostic for multicollinearity, variance inflation factors (VIF) were calculated for all explanatory variables using the reduced estimation sample. The obtained values are reported in Table 3b.

Table 3b. Variance Inflation Factors (VIF)

Variable	R ²	VIF	Status
Inflation	0.2399	1.32	No serious multicollinearity
Industry	0.0048	1.00	No serious multicollinearity
Domestic credit	0.5387	2.17	No serious multicollinearity

FDI	0.3935	1.65	No serious multicollinearity
Unemployment	0.5056	2.02	No serious multicollinearity
GDP per person employed	0.4294	1.75	No serious multicollinearity

Source: Authors (2025).

Note: All variance inflation factors are below the commonly used threshold of 5, which suggests that the explanatory variables do not exhibit severe multicollinearity in the estimation sample. The highest VIF is observed for domestic credit (2.17), which remains well within acceptable limits.

Socioeconomic communities share a common goal of ensuring the prosperity of their members, which is measured through precise indicators such as GDP dynamics over a given period. The quality of the economy, the business and administrative environment, and macroeconomic stability play a crucial role in shaping GDP performance.

DISCUSSION

1. Linking the Results with the Hypotheses:

- **H1 (labor productivity)** – H1 is not supported by the reported results. The coefficient for labor productivity is negative and statistically insignificant (Estimate = -0.074414; $p = 0.214$), which means that the model does not provide empirical evidence of a positive and statistically significant effect of labor productivity on GDP growth in the analyzed sample.
- **H2 (availability of financial resources)** – The results do not support a positive effect of domestic credit on GDP growth in the present specification. The estimated coefficient for private sector credit is negative and statistically insignificant (Estimate = -0.051781; $p = 0.152$), so it cannot be interpreted as a positive trend. At most, the findings indicate that no robust empirical support for H2 is obtained in this model.
- **H3 (macroeconomic stability)** – H3 is not empirically supported in the baseline model. Both macroeconomic stability indicators included in the specification—inflation ($p = 0.509$) and unemployment ($p = 0.775$)—are statistically insignificant. However, in the robustness specification excluding the COVID-19 years, unemployment becomes statistically significant with a negative coefficient, suggesting that its effect may be sensitive to sample composition.

2. Comparison of the Results with the Existing Literature

- The findings should be interpreted with caution in relation to the existing literature. While prior studies often report positive roles for productivity, finance, investment, and institutional quality, the present model does not produce statistically significant coefficients for these variables in the Western Balkan sample.
- The discrepancy between theoretical expectations and the estimated coefficients may reflect limited sample size, cross-country heterogeneity, measurement issues, or omitted structural and institutional determinants. Therefore, the fixed-effects specification should be viewed as an initial empirical

framework rather than definitive evidence on the drivers of GDP growth in the region.

- The results do not justify strong causal policy claims based on the estimated coefficients alone. Nevertheless, reforms aimed at improving the business and administrative environment remain relevant from a broader theoretical and developmental perspective.
- Similarly, macroeconomic stability remains important in theory, but the current empirical specification does not provide statistically significant evidence that inflation or unemployment explains GDP growth in the observed sample.

3. Policy and Practical Implications

The present results can be more precisely positioned within the existing literature by distinguishing between theoretical expectations and empirically observed regional heterogeneity. A substantial part of the literature emphasizes the positive contribution of productivity, financial intermediation, foreign direct investment, and institutional improvement to long-term growth. However, the evidence is not uniformly consistent across transition economies or within the Western Balkans. In that sense, the absence of statistically significant coefficients in the current specification should not be interpreted as an anomaly, but rather as an indication that the growth effects of these variables may be conditional, nonlinear, or highly dependent on country-specific institutional and structural contexts. This interpretation is supported by studies that report negative, weak, or unstable FDI effects in the Western Balkans, as well as by analyses showing that the contribution of foreign capital cannot be generalized across transition economies because the estimated parameters vary considerably across countries. Likewise, recent regional studies suggest that the interaction between institutions and investment may produce unexpected outcomes, which means that nominal increases in credit availability, investment inflows, or labor productivity do not automatically translate into measurable GDP growth within a short or medium-term panel specification. From this perspective, the discrepancy between theoretical expectations and the current empirical findings may reflect several overlapping factors: limited sample size, the relatively small number of countries, omitted institutional or structural controls, differences in absorptive capacity, and the presence of external shocks during the observed period, especially around the COVID-19 years. Accordingly, the current results are best understood not as a rejection of the broader theoretical literature, but as evidence that the determinants of GDP growth in the Western Balkans are more context-dependent and empirically unstable than simplified linear expectations might suggest.

The additional robustness check excluding the COVID-19 years also refines the interpretation of the baseline findings. In the reduced sample, the coefficients for inflation, domestic credit, and labor productivity remain statistically insignificant, which reinforces the conclusion that the absence of strong empirical support for the main hypotheses cannot be attributed solely to pandemic-related volatility. At the same time, two variables become statistically significant in the COVID-excluded specification: industry (including construction), value added (% of GDP) and unemployment, both with negative coefficients. This suggests that once the exceptional pandemic shock is removed, certain structural relationships become more visible, especially those relat-

ed to the composition of output and labor-market conditions. However, these changes should still be interpreted cautiously. First, the signs of the significant coefficients are not fully aligned with simplified theoretical expectations. Second, foreign direct investment remains negative and only marginally close to conventional significance, which confirms that the estimated effects remain sensitive to model specification and sample composition. Therefore, the robustness check does not overturn the cautious interpretation of the baseline model; rather, it indicates that the empirical relationships in the Western Balkans may be contingent on extraordinary macroeconomic episodes and that some coefficients are unstable across alternative sample definitions.

Overall, the results are better interpreted as only weakly connected to prior theoretical expectations, since the reported estimates do not provide statistically significant empirical confirmation for the main explanatory variables included in the model.

CONCLUSION

This study examined the impact of business, administrative, and macroeconomic factors on GDP growth in Western Balkan countries that are not members of the European Union. The analysis was conducted using a fixed-effects panel data model for the period 2010–2024, with labor productivity, industrial value added, domestic credit, foreign direct investment, inflation, and unemployment included as explanatory variables.

The estimates reported in Table 3 indicate that none of the explanatory or control variables is statistically significant at conventional levels in the present specification. Accordingly, the study does not provide empirical support for the three proposed hypotheses in their stated form. Rather than confirming direct effects of productivity, domestic credit, foreign direct investment, or macroeconomic stability on GDP growth, the findings suggest that the observed growth dynamics may also depend on additional structural, institutional, and country-specific factors not fully captured by the model.

Within these limitations, the study still points to the broader relevance of:

- Improving the business and administrative environment,
- Enhancing access to domestic and foreign financial resources, and
- Maintaining macroeconomic stability.

The contribution of this study should also be interpreted in relation to the broader empirical debate on growth determinants in transition and Western Balkan economies. While a considerable body of literature emphasizes the developmental role of productivity, financial deepening, foreign direct investment, and institutional improvement, more recent regional evidence suggests that these relationships are often empirically unstable, context-dependent, and sensitive to model specification. In that sense, the present findings do not necessarily contradict earlier research, but rather align more closely with studies showing that foreign direct investment may generate weak, negative, or institutionally mediated effects, and that the contribution of finance and productivity cannot be assumed to be uniform across small transition economies. The insignificance of the coefficients obtained in this model may therefore reflect the fact that GDP growth in the Western Balkans is shaped not only by the direct presence of credit, investment, or labor productivity improvements, but also by differences in institutional quality, absorptive capacity, industrial structure, and vulnerability to external shocks. This perspective is particularly relevant for a region characterized by

incomplete structural transformation, uneven reform outcomes, and strong exposure to external demand conditions. Accordingly, the present study adds value not by confirming simplified linear growth assumptions, but by highlighting the empirical limits of such assumptions in a heterogeneous regional setting. In this way, the paper contributes to the literature by showing that the absence of statistical significance may itself be an analytically meaningful result when examining growth dynamics in small transition economies under conditions of institutional and macroeconomic fragility.

The additional robustness check excluding the COVID-19 years further refines the interpretation of the study's conclusions. In the reduced sample, inflation, domestic credit, and labor productivity remain statistically insignificant, which confirms that the absence of strong support for the main hypotheses cannot be explained solely by pandemic-related volatility. However, the COVID-excluded specification also indicates that industry (including construction), value added (% of GDP) and unemployment become statistically significant, both with negative coefficients, while foreign direct investment remains negative and only marginally close to conventional significance levels. These findings suggest that the baseline conclusion of generally weak empirical support should be retained, but with an important qualification: some coefficients are sensitive to extraordinary macroeconomic episodes and to the composition of the estimation sample. Therefore, the robustness exercise does not overturn the cautious interpretation of the main model, but it does show that the determinants of GDP growth in the Western Balkans may become more visible once crisis-specific years are removed, especially in relation to output structure and labor-market conditions.

However, these implications should be treated as indicative rather than conclusive, because they are grounded more in theory and prior literature than in statistically significant coefficients from the present model. Future research should therefore expand the dataset, clarify variable construction, introduce additional institutional and structural controls, and perform diagnostic and robustness checks in order to identify the determinants of GDP growth in transition economies more reliably.

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