

Economics of Corruption: Demand Side Case of Western Balkan Countries

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Abstract: - Corruption is a very negative phenomenon, which distorts markets and harms economic growth. Corruption has its side of supply and demand. Both supply and demand for corruption are influenced by many factors. The purpose of this article is to identify some macroeconomic and institutional factors that lead to the demand for corruption in the Western Balkans. The Corruption Perception Index and Control of Corruption index are used as measures of corruption, therefore in this paper two models are built, where independent variables are real income per capita, inequality gap, unemployment rate, rule of law, and government efficiency. A panel model, with data for the period 2012-2022 is used to identify the most important variables affecting corruption in the Western Balkans. The results show that the index used to measure corruption affects the statistical significance of the variables, with inequality gap and rule of law being significant in both models. The identification of the factors can serve the governments of these countries to design policies and adopt strategies that will reduce the involvement of people in corrupt practices.

Key-Words: - Corruption, Demand, Macroeconomic factors, Government Policies, Panel data, Fixed Effects, Random Effects.

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1 Introduction

There are different definitions of corruption. [1] defined corruption as an extra-legal institution used by individuals or groups to gain influence over the actions of the bureaucracy. A similar definition is given by [2]¹ who stated that corruption is a behavior which deviates from accepted norms in order to serve private ends. The [3]² defines corruption as "*the abuse of public office for private gains*". This definition gives the idea that corruption is present

only in the public sector. Corruptive behaviors have been seen in the private sector too. Another more complete definition is provided by the Transparency International, which defines corruption as the misuse of entrusted power for private gains.

Despite various definitions, it is widely accepted that corruption implies the use of authority for private gain. Researchers have been studying corruption for years. This is because it is widely accepted that corruption has negative effects on the economy.

Corruption distorts markets and weakens the role of government as a market regulator and guarantor of rights. If government regulation can be overcome through corruption, or if property rights become a "market commodity" by the public servant, then markets can fail, investments, especially foreign ones, will fall [4]³ and there will be negative effects on economic growth [5]. On the other hand, corrupt payments increase business costs [6], and increase the burden especially on the poor, who must pay to receive services or to have their rights respected, thus leading to a further deterioration of their economic situation. In addition to the negative impact on the economy, corruption also has a negative impact on democracy. Corruption compromises the effects of government policies, as well as undermines public confidence in democratic institutions. It is considered as an important indicator of the performance of a political system [7].

But what is considered a corrupted behavior? According to the United Nations Convention Against Corruption UNCAC⁴ the most common actions that are considered corrupted are: bribery, embezzlement, trading in influence.

- Bribery in the public and private sector, whether briber-initiated or bribe-initiated is the amount given in a corrupt relationship. The goal is to facilitate arrangements, to get things done with less effort. The bribe is usually considered grease money because it enables the bureaucratic apparatus of the state to move faster. This is the case when individuals or businesses evade taxes, when they do not comply with legal restrictions, etc.

- Embezzlement is the theft and misuse of public funds by state officials. However, the private sector also suffers from this form of corruption.

- Trading in influence occurs when a state official is promised or offered a reward in order to exert his influence in the state administration to create advantages for the interested party. This also means access to take advantage of state resources.

The effectiveness of the fight against corruption depends on a number of factors of economic, social and political nature. The purpose of this article is to identify some macroeconomic and institutional factors that influence the demand for corrupted acts. The second section presents different definitions of corruption and the factors that generally affect corruption in a country. The third section is dedicated

to the literature review. The fourth section provides an analysis of the level of corruption and some macroeconomic factors in Western Balkans, and the analysis of the econometric models, which serve to identify the factors that affect the demand for corruption in these countries. The article concludes with recommendations towards the situation improvement.

2 Corruption: Definition and Determinants

Corruption is not a variable that can be measured directly in the economy. By its very nature, it is not possible to have accurate measurements of it. For this reason, different indexes try to measure the perception of individuals about the degree of corruption in a country. These indexes are built on the basis of questionnaires. Among the various indexes, some that can be mentioned are:

- **International Country Risk Guide Index** tries to capture the extent to which "high government officials are likely to demand special payments" and to which "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans." The index score is a weighted average of three sub index scores: The Political Risk Index (calculated with a maximum of 100 points), the Financial Risk Index (calculated with a maximum of 50 points), and the Economic Risk Index (calculated with a maximum of 50 points). In calculating the total points of the index, the Political Risk accounts for 50% of the total points, while the Financial and Economic risk account for 25% respectively. The range of the total points is zero to 100. Countries are ranked based on the total points of the ICRG index: up to 49.9 points means Very High risk, and from 50 to 100 points means Very Low Risk.

- **Global Competitiveness Report Index** suggests a measure of perception of corruption from the business perspective. Through a survey with firm's managers the perception on "irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection or loan applications" is quantified. The respondents are asked to rate the perceived level of corruption in a 1 to 7 scale.

³ <https://www.nber.org/papers/w6030>

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https://www.unodc.org/documents/brussels/UN_Convention_Against_Corruption.pdf

Countries are ranked using the average scale of respondents in the corresponding country. The composite score ranges from 0 to 100, with 0 being the “highly corrupt”, and 100 “very clean”.

-Business International Index tries to measure the degree to which business transactions involve corruption or questionable payments. Respondents choose a value from 0 to 10, with 10 being the “very clean” to rate the perceived corruption in a country.

-Corruption Perception Index ranks countries by their perceived level of public sector corruption. Data from 13 different datasets are used to calculate the index. For each country at least three assessments are made with different data in order to calculate the index. The CPI reflects the corruption perception of businesspeople and business analysts. Even though there exists corruption in the private sector as well, the CPI measures the perception of corruption only in the public sector. Countries are ranked on a scale from 0 (very corrupt) to 100 (very clean).

--Control of Corruption measures perceptions of the degree to which public power is used for private benefit, including both small-scale and large-scale corruption, as well as the “capture” of the state by elites and special interest. According to the World Bank definition, corruption is a failure of governance because it frequently results from a lack of respect for the laws that regulate the interactions between the corrupted (usually a public official or politician) and the corrupter (usually a private citizen or firm) [8]. The values of the index vary from -2.5 to 2.5, where the lowest values indicate a perception of high corruption, while high positive values indicate a perception of low corruption.

Regardless of what index they have used, various researchers have tried to identify the factors that affect the level of corruption in a country. Researchers have identified several factors, that directly or indirectly affect it. Among many factors, [8]⁵ identified as direct factors:

-Regulations and authorizations: the need to obtain a license or permit to conduct business activity gives the civil servant a kind of monopoly power. These clerks can put pressure on those interested with the goal to get bribes for themselves.

-Taxation: when the tax laws are not clear or when the civil servant has discretion over important decisions (the provision of tax incentives, selection

of audits, etc.) the possibility for the official to be involved in a corrupted practice increase.

-Spending decisions: investment projects, procurement spending are decisions that government officials often use to secure benefits for themselves. Public projects are often used to favor certain parties over the bribe.

As indirect factors, among others [9] identified:

-Quality of the bureaucracy: corrupt acts are committed mainly by state officials. If these officials are not hired and promoted on the basis of merit, that will result in a higher level of corruption in the country [10]. Employment for political reasons, nepotism and unclear rules of employment or promotion result in corrupted behavior of the public servant.

-Level of public sector wages: low public sector wages can encourage employees to engage in corrupted acts [11].

-Penalty systems: the lighter the penalties, the more widespread the corruption.

3 Literature Review

[12] in a study of 41 developing countries, analyze the determinants of corruption, dividing them into two groups of factors: economic and non-economic. As a measure of corruption, the authors use the CPI. Cross-sectional analysis, with data for 2006, shows that among the economic factors, the level of income and globalization, economic freedom, the level of education result in influencing the level of corruption, while the distribution of income does not result in this impact. The study reaches the conclusion that non-economic factors, such as freedom of the press, religion, and democracy have no influence on the level of corruption in these countries.

Using panel data analysis for the period 2004-2010 for several developing countries, [13] concludes that foreign direct investments, the export of natural resources and the level of economic development are among the most important factors that influence corruption in these countries. The study also suggests that other factors, such as country size, state of democracy, and colonial legacy, have an impact on the perception of corruption in developing countries. [14], in a study for 92 countries, with data for 2014, suggests that different economic, political and social factors, such as the level of economic development,

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<https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Corruption-Around-the-World-Causes-Consequences-Scope-and-Cures-2583>

political stability, religion, level of education, state of democracy, economic freedom have an impact on the perception of corruption in these countries, although the magnitude of this impact differs between developing and developed countries.

Using a panel data model, with data for the period 1996-2019 for the Visegrad countries, [15] suggest that different economic and political factors affect the perception of corruption in these countries, such as: level of economic development, degree of globalization, government consumption, degree of urbanization, share of women in the labor force, regulatory quality, income inequality.

Using the CPI as a measure of corruption, with data for the period 2003-2021, [16] use a panel data model to identify the determinants of corruption in Developing-Eight (D-8) countries. The authors suggest that human development index, economic freedom and taxes as % of GDP have an important impact on the corruption index, while government spending, GDP and inflation are statistically insignificant.

While there are many studies that analyze the impact of corruption on the economy in the countries of the Western Balkans, there are relatively few that identify some individual, mainly demographic factors that determine corruption in these countries.

In a study for Albania, [17] using data from a questionnaire conducted in the period January-February 2016, using cross-sectional data, where the level of corruption was measured on a scale from 1 to 10, reached the conclusion that the level of income, area of living and political orientation, all have an impact on corruption, while gender, age, capital, previous experience with corruption do not appear to have an impact on corruption.

With data from the National Survey of Citizens' Perceptions in Bosnia-Herzegovina, [18] use a logistic regression to analyze the likelihood that people engage in corrupt behavior, offering bribes to employees in the medical, judicial, police, public service and education sectors. The results of the study show that individuals with high level of income, who live in urban areas and are educated are more inclined to offer bribes. The study also shows that the impact of these factors is different in different sectors.

This work will complement the existing literature on this topic, identifying some macroeconomic and institutional factors that influence the demand for

corruption in the Western Balkan countries. Another contribution of this article is the methodology used: panel data has more information, allows for more variability, and provides more robust estimates than the cross-sectional method.

4 Empirical Analysis

4.1. Model Specification

Various researchers have tried to analyze the factors that motivate people to engage in corrupted practices. These factors are of economic, social, political nature, but also cultural factors. The purpose of this research paper is to identify the factors that can affect the level of corruption in the countries of the Western Balkans. Two models will be built for this purpose. In the first model, the Control of Corruption index will be used as a measure of corruption, while in the second model, the Corruption Perception Index will be used. Independent variables in both models will be real income per capita, unemployment rate, government efficiency, rule of law and inequality gap:

$$CC/CPI = f(RGDPC, UNEMPL, GE, RL, IG) \quad (1)$$

where:

-CC represent the control of corruption index. Data is taken from the World Bank database⁶.

-CPI represents the corruption perception index. Data is taken from the Transparency International Database⁷.

-RGDPC represents real GDP per capita, PPP (constant 2017 international \$), which is considered as a proxy for the economic development of a country. The higher the economic development, the lower the incentive for people to engage in corrupted practices, so a negative relationship between RGDPC and corruption is expected [19], meaning that an increase in the value of the RGDPC will improve the score of the corruption index. Data for this variable is taken from the World Bank database.

-UNEMPL represents the unemployment rate of a country. The higher the unemployment rate, the more people are expected to be involved in corruption, so a positive impact of this variable on the level of corruption is expected [20]⁸, resulting in a decrease of the corruption index. Data for this variable is taken from the World Bank database.

-GE is a variable that reflects opinions on the standard of public services, the credibility of the

⁶ <https://data.worldbank.org/>

⁷ <https://www.transparency.org/en>

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<https://openknowledge.worldbank.org/handle/10986/25158?show=full>

government's commitment to implementing appropriate programs, the standard of the civil service and the extent of its independence from political control, and the quality of policy formulation and execution. Values for this variable varies from -2.5 to +2.5, with low values showing weak governance performance and high values showing strong governance performance. Data for this variable is taken from the World Bank database. -RL is a variable that reflects opinions about how much agents trust and follow social norms, especially regarding the reliability of the police, courts, property rights, and contract enforcement, as well as the probability of crime and violence. Values for this variable range from -2.5 to 2.5 with low values showing weak governance performance and high values showing strong governance performance. Data for this variable is taken from the World Bank database.

-IG represents the inequality gap. The rich people are likely to have both greater motivation and opportunities to engage in bribery and fraud as one means to preserve and advance their status, privileges, and interests while the poor are more vulnerable to extortion at higher levels of inequality [21]⁹. Data for this variable shows the pre-tax national income that goes to the bottom 50% of the adult population. Data is taken from the World Inequality Database¹⁰ for the years 2013-2021. Data for the 2022 is not available, so for this year the average of the two previous years is used as an estimate for it.

First, the data is tested through pooled regression. This model suggests that all countries have the same characteristics and analyzes panel data as time-series data:

$$Y_t = \beta_0 + \beta_1 X_{1,t} + \beta_2 X_{2,t} + \dots + v_t \quad (2)$$

The model results with a single intercept and coefficients for all countries, ignoring heterogeneity. However, since the study includes different countries, there is the possibility of heterogeneity, which are specific characteristics of different countries. In pooled regression, these characteristics are included in the error term, which may be correlated with one or several of the independent variables:

$$COV(X_t v_t) \neq 0 \quad (3)$$

The pooled model can result in coefficients that are not BLUE, i.e. biased and inconsistent. Therefore, in the second stage, the data will be tested through the Fixed effect and random effect models, which

consider the existence of unobserved heterogeneity. The fixed effect model allows for different intercepts for each country, although these intercepts are time-invariant:

$$Y_{it} = \beta_{0i} + \beta_1 X_{1,it} + \beta_2 X_{2,it} + \dots + \beta_k X_{k,it} + \theta_i + \varepsilon_{it} \quad (4)$$

where

β_{0i} shows the intercepts of the equations in each country;

θ_i is a country-dependent error term, which is time-invariant, but different for different countries.

The random effect model includes heterogeneity in the error term, unlike the fixed effect model, which includes it in the intercept:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \beta_2 X_{2,it} + \dots + \beta_k X_{k,it} + \vartheta_{it} \quad (5)$$

where

β_0 is the average value of all intercepts of the Fixed effects model.

ϑ_{it} is the error term, which is composed of two components: country-specific error term and idiosyncratic error term, which shows the effect of unobserved variables.

To determine which model between pooled regression and fixed effects is more appropriate, the Likelihood ratio test is used. If p-value < 0.05 then the fixed effects is more appropriate than pooled model.

To choose between fixed effects and random effects, we use the Hausman test. If p-value < 0.05 then random effects may be correlated with the independent variables, therefore the Fixed effect model is more appropriate.

This study covers the period 2012-2022, and data were processed with the statistical package EViews 12.

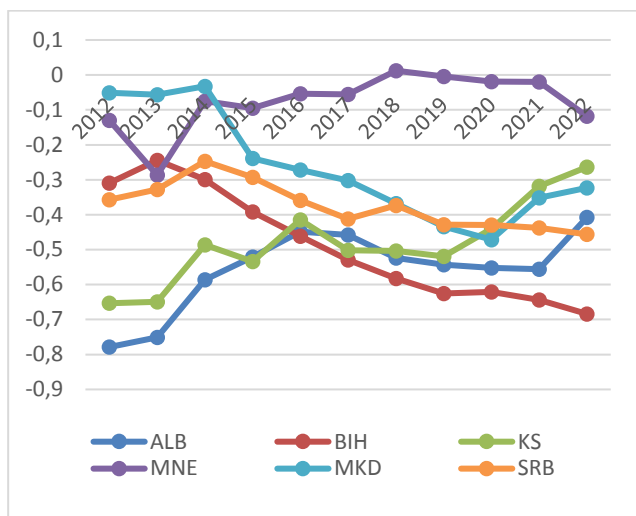
4.2. Variables analysis 2012-2022

During the period 2012-2022, regardless of what index is used to measure corruption, the Western Balkans are positioned in the group of countries with a high level of corruption. The corruption control index is negative for all countries, indicating a ranking below their average level. The best performance is that of Montenegro, which has values very close to 0, even for 2018 there is a positive assessment of corruption control. During the period under study, the index has improved in Albania and Kosovo, while in Bosnia and Herzegovina, North Macedonia and Serbia, a deterioration is observed.

⁹ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=489823

¹⁰ <https://wid.world/data/>

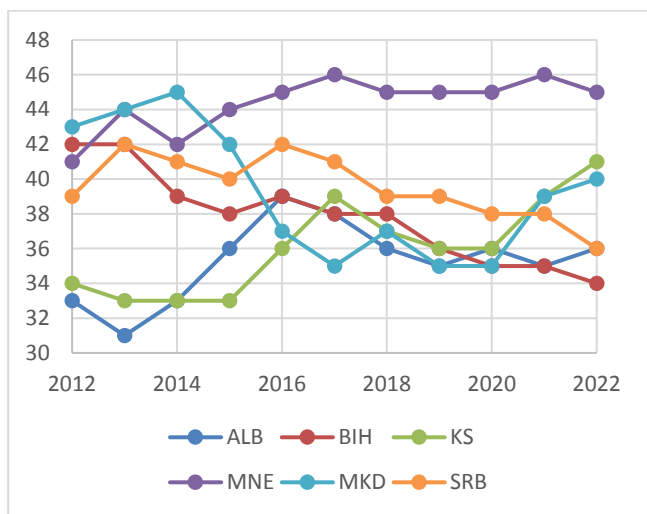
Fig.1. Control of Corruption Index WB, 2012-2022



@Authors calculations with data from WB database

If the CPI is used as a measure for corruption, it is noted that all countries, with the exception of Montenegro, have an estimate between 30-40 points for the entire period, showing no strong improvement in the indicator. Montenegro has an assessment of over 40 points throughout the entire period, an assessment which has always been increasing, reaching 46 points in 2021 and with an average assessment of around 45 for the entire period. The country with the lowest rating is Albania, which is rated between 31 and 39 points with an average rating of around 35 for the entire period, followed by Kosovo with an average rating of 36 points.

Fig.2. Corruption Perception Index WB, 2012-2022

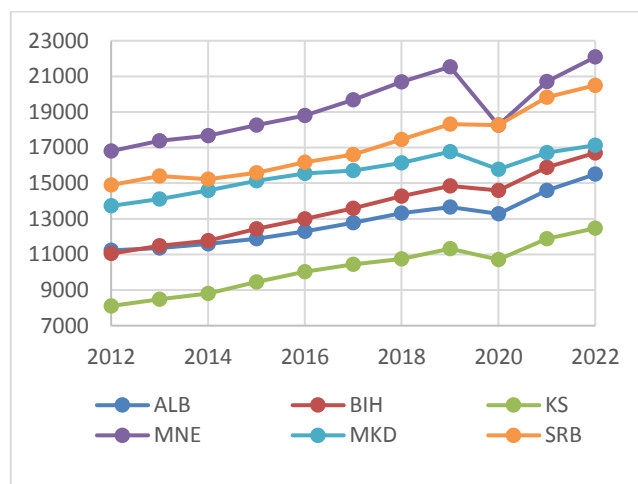


@Authors calculations with data from WB database

The level of GDP per capita in Western Balkans has been constantly increasing. At the beginning of the period the per capita income is between about \$8,100

(Kosovo) and \$16,800 (Montenegro). In the following years, the growth of GDP per capita has been stable, with the exception of 2020, where GDP per capita has fallen in all countries, due to the pandemic. In 2022 GDP per capita has increased, and the level has exceeded that of the period before the pandemic.

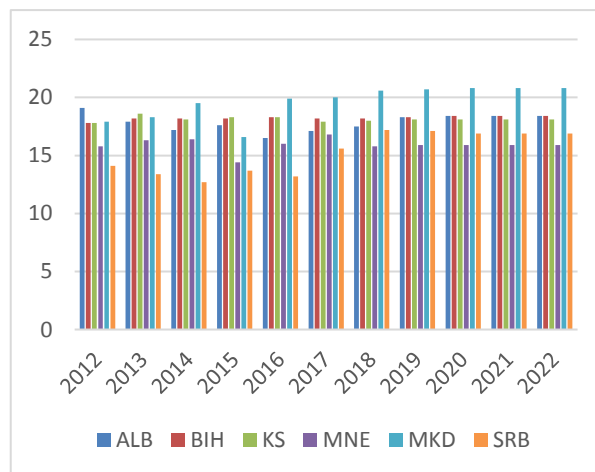
Fig. 3. Real GDP/c in WB, 2012-2022.



@Authors calculations with data from WB database

Although GDP per capita has increased in all the countries of the Western Balkans, the distribution of income has not been fair. The country with the highest inequality is Serbia, where for the entire period, only about 15% of the income goes to the bottom 50% of the population. The country with the best performance is North Macedonia, where on average about 20% of the income goes to the bottom 50% of the population.

Fig. 4. Inequality Gap in WB, 2012-2022.

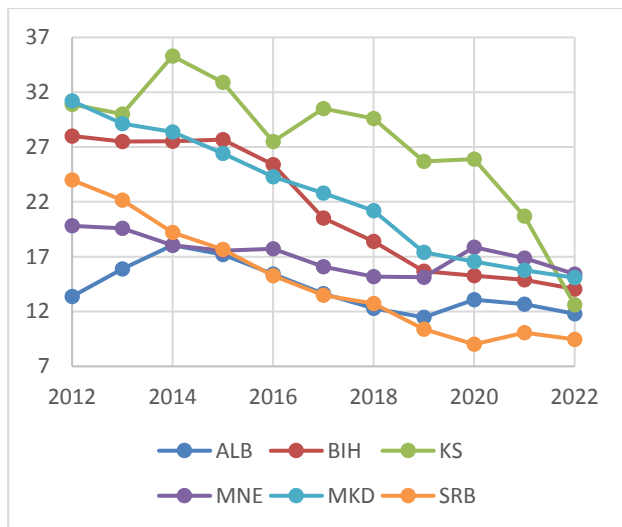


@Authors calculations with data from WB database

Regarding the level of unemployment, during the period under study, unemployment has been

consistently above the level of 9% for all countries, although the level has been in continuous decline. Albania and Serbia have the best performance, where the average unemployment rate for the entire period is around 14%, while in Bosnia & Herzegovina, and North Macedonia the average is around 22%. The worst performer country is Kosovo, with the average unemployment rate of 27.5%.

Fig. 5. Unemployment Rate in WB, 2012-2022.



@Authors calculations with data from WB database

4.3. Model Analysis

Pooled regression model shows that regardless of how the dependent variable is measured, the model is statistically significant, because p-value F-statistics < 5%. In the case where corruption is measured through CC, the model explains about 78% of the variation, while in the case of the CPI index, the model explains about 70% of the variation in the values of the corruption index. Regardless of the index used for corruption, RGDP, UNEMPL, RL have positive signs and are statistically significant. GE is statistically significant at 1% in the case of CC and 10% in the case of CPI. IG has a negative sign and is statistically significant in the case of CPI, while it is statistically insignificant in the case of CC.

Table 1. Pooled Regression

Var	CC		CPI	
	Coeff	p-value	Coeff	p-value
RGDPC	0.435265	0.0002	6.126814	0.0161
GE	0.226747	0.0000	1.753908	0.0952
IG	-0.008997	0.2212	-0.556036	0.0012

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https://www.nber.org/system/files/working_papers/w19483/w19483.pdf

UNEMPL	0.019498	0.0000	0.261202	0.0000
RL	0.47157	0.0018	11.57457	0.0007
R-sqr	0.782519		0.705805	
Adj R-sqr	0.764396		0.681289	
Prof F-st	0.000000		0.000000	

@Authors calculations with data from WB database

The fixed effects model is statistically significant for both indices, CC and CPI. The CC model explains about 84% of the variation, while the CPI model explains about 76% of the variation. These values are higher than the respective Pooled regression values. In the case of the CC index, all variables are statistically significant at 5%, while in the case of the CPI index, only IG and RL are statistically significant. Regarding the real GDP per capita variable, the positive sign suggests a direct link between it and the corruption indexes: an increase in the level of income will be accompanied by an increase in the corruption rating. The same conclusion was reached by [19]¹¹ in their study. The negative sign of the Inequality Gap variable suggests an inverse relationship between this variable and the corruption indexes, so an improvement in the distribution of income in the economy is accompanied by a decrease in the corruption rating points. This result is consistent with the conclusion reached by [21]. The Unemployment variable has a positive sign, contrary to the expectation of a negative impact on the value of the index.

Table 2. Fixed effects Model

Var	CC		CPI	
	Coeff	p-value	Coeff	p-value
RGDPC	0.419478	0.0256	5.369763	0.2189
GE	0.220218	0.0226	3.673714	0.1030
IG	-0.040262	0.0033	-1.212303	0.0002
UNEMPL	0.013181	0.0036	0.115779	0.2621
RL	0.484427	0.0053	8.926768	0.0275
R-sqr	0.842325		0.764205	
Adj R-sqr	0.813657		0.721334	
Prof F-st	0.000000		0.000000	

@Authors calculations with data from WB database

The Likelihood ratio Test shows that for both indices, the most appropriate model is the Fixed Effects model, because p-value < 5%.

Table 3. Likelihood Ratio Test

	CC		CPI	
Effects Test	statistic	p-value	statistic	p-value
Cross-section F	4.17231	0.0028	2.72440	0.0286
Cross-section Chi-square	21.2240	0.0007	14.6045	0.0122

@Authors calculations with data from WB database

The analysis of the random effects model shows that the model is statistically significant, with the highest R-squared value in the case of the CC index. Regarding the variables, RGDP, UNEMPL and RL are statistically significant, while GE is statistically significant at 10% in the case of CPI. The IG variable is significant only in the case of the CPI.

Table 4. Random Effect Model

	CC		CPI	
Var	Coeff	p-value	Coeff	p-value
RGDP	0.435265	0.0000	6.126814	0.0103
GE	0.226747	0.0000	1.753908	0.0748
IG	-0.008997	0.1697	-0.556036	0.0006
UNEMPL	0.019498	0.0000	0.261202	0.0000
RL	0.47157	0.0005	11.57457	0.0003
R-sqr	0.782519		0.705805	
Adj R-sqr	0.764396		0.681289	
Prof F-st	0.000000		0.000000	

@Authors calculations with data from WB database

The p-value of the Hausman test is less than 5% and this suggests that between fixed effects and random effects, the most appropriate model to explain the long-term relationship between independent variables and corruption is the fixed effects model, regardless of which index is used for measure corruption.

Table 5. Hausman test results

	CC		CPI	
Test Summary	Chi-Sq. Statistic	p-value	Chi-Sq. Statistic	p-value
Cross-section random	20.861563	0.0009	13.62203	0.0182

@Authors calculations with data from WB database

5. Conclusion and Future Work

Corruption is considered a harmful phenomenon, which negatively affects not only the economy, but also the rule of law and democracy. The design of strategies and the implementation of measures against this phenomenon is a central topic of public and political debate. The success of these strategies depends on political, economic, social, cultural factors, etc.

The purpose of this article is to identify some macroeconomic and institutional factors that affect the demand for corruption in Western Balkan countries. Among the various factors suggested by previous studies on this phenomenon, this article includes Real GDP per capita, Unemployment Rate, Inequality Gap, Government Efficiency, and Rule of Law.

Between Pooled, Fixed effects and Random effects models, the most appropriate one to explain the long-term relationship between these variables and corruption is the Fixed effects model. However, the model's conclusions depend on how corruption is measured, because in the case where it is measured through the Control of Corruption index, the model suggests that all variables are statistically significant, while in the case where the Corruption Perception Index is used to measure corruption, only Inequality gap and Rule of Law are statistically significant. However, the Control of Corruption model is more robust, as it explains about 84% of the variation, while the CPI model explains only about 76.4% of the corruption variation. This conclusion does not change even though the coefficients of the CPI model are greater than those of the CC model, as the purpose is to identify the factors that affect the corruption assessment, not the extent of this impact.

As expected, economic development is accompanied by an increase in the public's perception of keeping corruption under control, while the positive sign of the variable Unemployment should be further investigated to discover the reasons for such an impact.

The model suggests that policymakers design strategies and implement policies that lead to a better distribution of income in the economy. Also, the strengthening of institutions and the rule of law will positively affect the perception of corruption control in the Western Balkans.

In the future, this work will be expanded, to include other microeconomic or social and cultural factors, which can influence the demand for corruption and other corruption indexes. It is the

objective of the authors to also study the supply side of corruption, to give a more complete picture of the economics of corruption.

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APPENDIX

Fig. 1A. Normality Test of Residuals

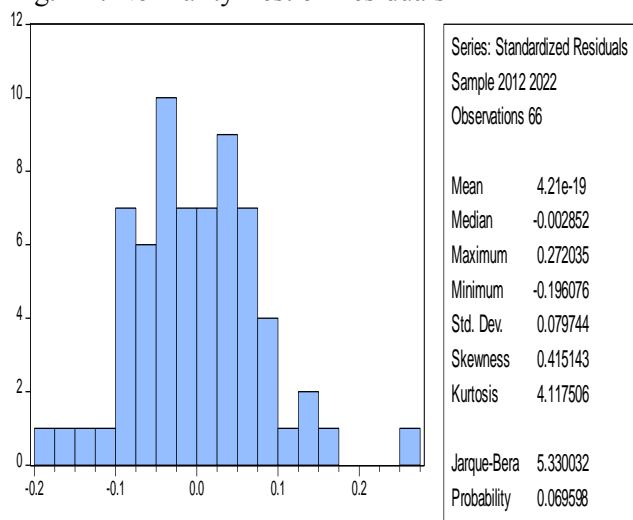


Table 1A. Residual Cross-Section Dependence Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	21.30665	15	0.1273
Pesaran scaled LM	1.151431		0.2496
Bias-corrected scaled LM	0.851431		0.3945
Pesaran CD	-1.345916		0.1783