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# THE IMPACT OF TOURISM ON ECONOMIC GROWTH: AN EMPIRICAL ANALYSIS OF THE REPUBLIC OF SERBIA

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**Abstract**

This paper explores how tourism influences Serbia's economic performance through an empirical analysis of time series data. The objective is to assess the long-run stability of the relationship and the causal dynamics between tourism indicators and gross domestic product. Methodologically, the research applies cointegration procedures and Granger causality testing, relying on macroeconomic and sector-specific variables such as tourist arrivals and tourism revenues. Findings reveal a persistent long-run link between tourism activity and economic growth, while causality analysis points to a bidirectional relationship between the examined variables. These insights enhance comprehension of tourism's contribution to Serbia's development and offer a foundation for shaping policies that reinforce the sector as a catalyst of economic progress.

**Key words**: tourism, economic growth, Republic of Serbia, time series, cointegration, Granger causality, empirical analysis.

# УТИЦАЈ ТУРИЗМА НА ЕКОНОМСКИ РАСТ: ЕМПИРИЈСКА АНАЛИЗА НА ПРИМЕРУ РЕПУБЛИКЕ СРБИЈЕ

**Апстракт**

Овај рад истражује утицај туризма на економски раст Републике Србије применом емпиријске анализе временских серија. Циљ истраживања је испитивање дугорочне повезаности и смера узрочности између туристичких показатеља и бруто домаћег производа. У раду су примењене методе коинтеграције и Грејнџерове каузалности, уз коришћење релевантних макроекономских и туристичких индикатора, попут туристичких долазака и прихода од туризма. Резултати истраживања указују на постојање стабилне дугорочне везе између туризма и економског раста, док тестови каузалности потврђују постојање двосмерне

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узрочности између посматраних варијабли. Добијени налази доприносе бољем разумевању улоге туризма у економском развоју Србије и пружају основ за креирање ефикасних политика усмерених на јачање туристичког сектора као покретача привредног раста.

**Кључне речи**: туризам, економски раст, Република Србија, временске серије, коинтеграција, Грејнџерова каузалност, емпиријска анализа.

## *INTRODUCTION*

In the context of contemporary globalization, tourism represents a highly dynamic and rapidly expanding sector of the world economy. Its significance is reflected in its contribution to gross domestic product and employment, as well as in international capital flows. Moreover, tourism generates substantial multiplier effects on related sectors, such as transportation, trade, and hospitality. Based on data from the World Tourism Organization (UNWTO, 2024), international tourism flows have been steadily recovering and growing following global disruptions, confirming the sector's resilience and its role in promoting global economic growth. Recent empirical research further emphasizes the role of tourism as a key contributor to economic expansion and development (World Travel & Tourism Council, 2023).

In both theoretical and empirical literature, particular attention is given to the tourism-led growth hypothesis, which posits that tourism development has a positive effect on overall economic activity and the growth of gross domestic product. This hypothesis was first empirically examined by Balaguer and Cantavella-Jordá (2002), while later studies confirmed the existence of a long-run relationship between tourism and economic growth, with differing findings regarding the direction of causality between the variables (Brida, Cortes Jimenez & Pulina, 2016; Su et al., 2021). Contemporary studies suggest that the relationship between tourism and economic growth may be bidirectional, meaning that tourism stimulates economic growth, but higher levels of economic development also generate greater demand for tourism services.

Following global trends, the Republic of Serbia has also experienced growth in tourist activity over the last decade, driven by improvements in tourism offerings, infrastructure development, and increased international competitiveness of the destination. Tourism is increasingly recognized as a potential driver of economic growth, particularly considering its effects on employment, foreign exchange inflows, and regional development. Nevertheless, despite the growing importance of this sector, empirical research analyzing the relationship between tourism and economic growth in Serbia remains relatively limited. This is especially true for studies applying modern econometric methods, such as time series analysis and causality testing. However, the existing literature on Serbia is additionally constrained by relatively short and/or inconsistent time series, as well as

limited application of more advanced econometric techniques that could better capture long-run dynamics and causality mechanisms.

Based on the above, the aim of this paper is to empirically examine the existence of a long-term relationship and the direction of causality between tourism and economic growth in the Republic of Serbia. The study applies a time series econometric approach, including cointegration tests and Granger causality analysis, to determine the nature of the relationship between gross domestic product and key tourism indicators, such as tourist arrivals and tourism revenues. In contrast to most previous studies for Serbia, which rely primarily on standard linear specifications and simpler correlation or regression frameworks, this paper contributes by applying a more robust time-series methodology based on cointegration techniques and causality testing, thereby providing a more reliable identification of long-run equilibrium relationships and direction of influence.

In addition to methodological improvements, this study provides a clearer contextual distinction from previous research on Serbia and comparable economies, as it relies on more recent and updated data series and incorporates the seasonal component of tourism indicators, which is a key characteristic of tourism dynamics, thereby allowing for a more comprehensive assessment of the tourism–growth nexus.

The paper is structured in the following way: after the introduction, the second section presents a review of relevant literature, while the third section describes the data and research methodology. The fourth section presents the empirical results and their discussion, and the final section outlines conclusions and policy implications. This research contributes to a better understanding of the role of tourism in Serbia's economic development, thereby providing a basis for designing more effective policies aimed at sustainable growth and development.

## *LITERATURE REVIEW*

In contemporary economic research, tourism is recognized as a significant driver of economic growth, particularly in developing countries and transition economies. The theoretical foundation of this relationship is based on the tourism-led growth hypothesis (TLGH), which assumes that tourism development contributes to gross domestic product growth through foreign exchange earnings, employment generation, and multiplier effects in related sectors (Balaguer & Cantavella-Jordá, 2002). In the literature, TLGH is most commonly tested using various econometric approaches, including time series analyses and panel models, with results differing depending on the sample and applied methodological framework (Brida et al., 2016; Albaladejo et al., 2023).

Empirical literature suggests that the relationship between tourism and economic growth is not straightforward. While some studies identify a positive effect of tourism on economic growth, others indicate the exist-

ence of more complex and bidirectional relationships between these variables (Brida et al., 2016; Chou, 2013; Albaladejo et al., 2023). These differences in findings are often explained by structural characteristics of economies, including the degree of diversification and the institutional framework.

A significant number of contemporary studies apply time series analysis methods, including cointegration tests and Granger causality analysis, to examine the long-run relationship between tourism and economic growth. Recent empirical research confirms that a stable long-run equilibrium may exist between tourism revenues and gross domestic product, although the effects vary depending on the economies analyzed and the methodological approach (Lee & Brahmasrene, 2013; Chou, 2013; Albaladejo et al., 2023). Modern analyses also emphasize that the relationship between tourism and economic growth may be heterogeneous and dependent on institutional and structural characteristics of national economies (Brida et al., 2016; Lee & Brahmasrene, 2013).

In Central and Eastern European countries, research results point to the heterogeneity of tourism's impact on economic growth. In transition economies, tourism development depends on institutional reforms, infrastructure investment, and the degree of integration into international flows, with tourism often playing a significant role in regional development (Surugiu & Surugiu, 2013).

Empirical studies focusing on the Republic of Serbia and the Western Balkans indicate the growing importance of tourism as a factor of economic progress, but they remain relatively limited in terms of data scope and applied methodologies. The empirical findings of Hristov Stančić et al. (2022) suggest the existence of a long-run relationship between tourism and economic growth in Serbia, identified using cointegration analysis. Similar findings for developing economies highlight the importance of applying modern econometric approaches in analyzing the relationship between tourism and economic growth (Paramati et al., 2017; Seghir et al., 2015).

In the domestic literature, a significant contribution to understanding tourism development in Serbia is provided by Gligorijević and Kostadinović (2023), who analyze strategic directions for the development of the tourism sector and point to insufficient institutional support for tourism as an economic sector. Their findings complement empirical research on the relationship between tourism and economic growth, emphasizing that the effects of tourism largely depend on the quality of development policies and the long-term strategic orientation of the state.

Domestic authors also emphasize the importance of strategic documents and institutional support for tourism development in Serbia, highlighting that the quality of policies and coordination at the national and local levels have a decisive impact on the sector's competitiveness (Maksimović et al., 2026; Tourism Development Strategy of the Republic of Serbia 2016–2025). These findings align with empirical research on the relationship between tourism and economic growth in the Western Balkans,

which confirms the existence of a long-run relationship between tourism and economic growth, while also pointing to the importance of institutional factors and financial development (Selimi et al., 2017; Brida et al., 2016; Lee & Brahmasrene, 2013; Paramati et al., 2017).

Recent research further emphasizes the importance of specific forms of tourism in the Republic of Serbia, such as rural and sustainable tourism. Analyses indicate that territorial capital, authentic supply, and sustainable resource management are key factors for the long-term development of the tourism industry and its contribution to local economic growth (Radović, 2020; Bubalo Živković et al., 2025; Dašić, 2020).

Despite the growing body of research, a significant research gap remains in the literature. Most existing studies for Serbia rely on limited time series or apply a narrower range of econometric methods, which may affect the reliability and generalizability of results. Additionally, the direction of causality between tourism and economic growth, as well as the stability of their long-run relationship under conditions of economic shocks and changes in the global tourism environment, has not been sufficiently examined (Vuković & Kljajić, 2023; Bubalo Živković et al., 2025; Brida, Cortes-Jimenez & Pulina, 2016; Katircioglu, 2009).

The aim of this paper is to contribute to the existing literature by applying modern time-series econometric methods to the case of the Republic of Serbia, with a particular focus on examining cointegration and Granger causality between tourism and economic growth. The goal is to provide a clearer insight into the long-run relationship between the analyzed variables and to offer a reliable empirical basis for assessing the role of tourism in Serbia's economic development, as well as for formulating appropriate economic policies (Dritsakis, 2004; Katircioglu, 2009; Vuković & Kljajić, 2023; Bubalo Živković et al., 2025).

## *DATA AND METHODOLOGY*

This study is focused on analyzing the relationship tourism -growth, and an appropriate methodology has been defined. The following section provides a detailed overview of the applied quantitative methods, as well as the sequence of analytical steps implemented within the model. The research refers to the territory of the Republic of Serbia.

Economic growth is operationalized through gross domestic product at constant prices (GDP), while tourism demand is represented by the number of foreign tourists (NOFTOUR). As a control variable, the exchange rate RSD/EUR is included, expressed as an average value over the observed period (ER). The analysis covers quarterly data for the period 2002–2025, resulting in a sample of 96 observations in total. Data on gross domestic product and the number of foreign tourists were obtained from the official website of the Statistical Office of the Republic of Serbia, with GDP expressed in millions of dinars and the number of tourists in thousands. Exchange rate data were

collected from the website of the National Bank of Serbia. All variables were transformed into logarithmic form (L), both for statistical reasons and to reduce variability and facilitate interpretation of the results. The dynamics of the observed variables over time are presented in Figures 1, 2, and 3.

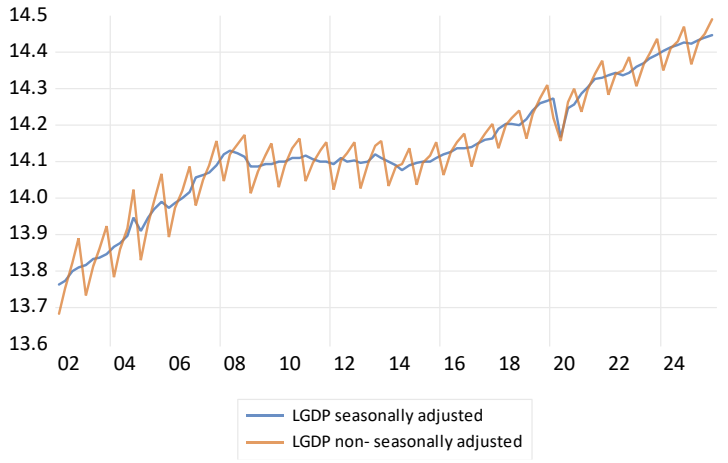


*Figure 1. Gross Domestic Product (logarithmic scale)*
*Source: Authors*

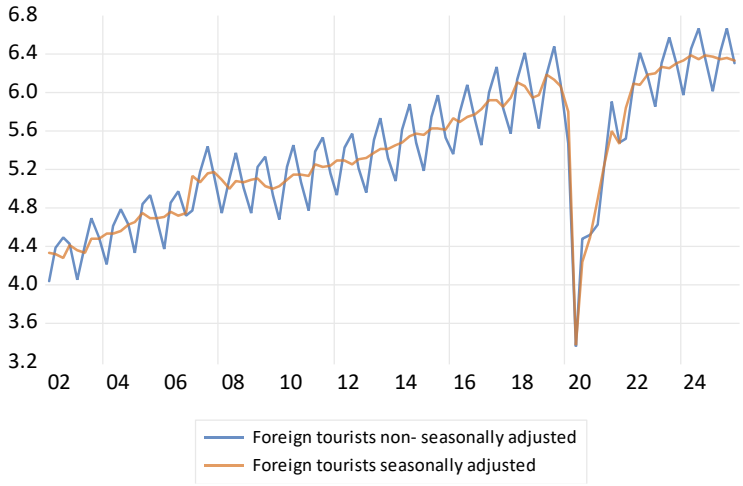


*Figure 2. Number of Foreign Tourists (logarithmic scale)*
*Source: Authors*


*Figure 3. Exchange rate (logarithmic scale)*
*Source: Authors*

For examining causality between economic variables in empirical literature, the Granger non- causality test is widely used. The direction of causality is analyzed within the framework developed by Granger (1969) and Sims (1972). According to Granger's definition, a variable $y_t$ is said to cause $x_t$ if the inclusion of past values of $y_t$ improves the prediction of $x_t$ compared to a model that excludes this information, under the assumption that all other conditions remain constant (*ceteris paribus*). However, a large body of econometric literature suggests that these tests primarily identify temporal precedence rather than true economic causality. This limitation is particularly pronounced in variables with a strong "*forward-looking*" character. Moreover, since these tests rely on asymptotic properties, they are valid only for stationary time series. When the series are non-stationary, integrated of order one, the standard approach involves differencing the data and estimating a VAR model in first differences. To overcome these limitations, this study applies the Toda–Yamamoto (1995) procedure for testing causality tourism- growth. The main advantage of this method is that it allows the estimation of a VAR model in levels, with the addition of extra lags corresponding to the maximum order of integration of the variables. In this way, problems related to non-stationarity and potential cointegration are avoided, thereby reducing the risk of model misspecification.

The empirical analysis is carried out in several sequential steps. First, the stationarity of each time series is tested, using the Augmented Dickey–Fuller (ADF) and Phillips–Perron (P–P) unit root tests. Based on the results, the maximum order of integration (*dmax*) is determined. Next, a VAR model in levels is specified, regardless of the integration properties of the variables.

Given the importance of lag selection in time series models, the optimal lag length is determined using several information criteria, supported

by appropriate diagnostic tests. Particular attention is given to model adequacy, including tests for residual autocorrelation and normality. Furthermore, for long-run relationship, the Johansen cointegration test is applied. This approach assumes that the series are non-stationary in levels but stationary in first differences, while the cointegration rank is determined using the trace and maximum eigenvalue statistics. In the final stage of the analysis, the Toda–Yamamoto procedure is implemented, which involves estimating an augmented VAR model of the form $k+dmax$, where $k$ denotes the optimal lag length and $dmax$ the maximum order of integration of the variables. The augmented VAR model can be represented as follows:

$$Y_t = \alpha_0 + \sum_{i=1}^{k+dmax} \alpha_i Y_i + \sum_{i=1}^{k+dmax} b_i X_i + \varepsilon_{1t}$$

$$X_t = c_0 + \sum_{i=1}^{k+dmax} c_i X_i + \sum_{i=1}^{k+dmax} d_i Y_i + \varepsilon_{2t}$$

Where $X_t$ and $Y_t$ represent the dependent and independent variables in the model, while $\alpha$ and $c$ are constants, and $\alpha_i$, $bi_i$, $c_i$, and $d_i$ are model parameters. The error terms are denoted by $\varepsilon_t$, and are assumed to exhibit the properties of white noise. For testing causality within the Toda–Yamamoto framework, a modified Wald test is employed. Rambaldi and Doran (1996) showed that the efficiency of the Wald test can be improved by applying Seemingly Unrelated Regression (SUR) models, particularly in the context of testing Granger causality. When implementing the test, the additional dmaxd_{max}dmax autoregressive parameters in the VAR model are disregarded, as they are included solely to correct for potential non-stationarity issues.

The test statistics in this approach follow an asymptotic distribution when estimated on the augmented VAR model. According to the Toda–Yamamoto procedure, the variables included in the analysis may be of different orders of integration—I(0), I(1), or I(2)—as well as cointegrated or non-cointegrated. The only requirement for the validity of the test is that the maximum order of integration does not exceed the optimally selected lag length in the VAR model.

## *EMPIRICAL RESULTS*

Table 1 presents the results of the unit root tests, which are used to determine the order of integration of the variables. In selecting the lag length, the AIC criterion was applied, with its value reported in parentheses. The results indicate that the variables of interest contain a unit root, regardless of whether the data are seasonally adjusted or non-seasonally adjusted. After transformation into first differences, all variables become stationary at the 5%

level of significance. Based on these findings, all three variables are integrated of order one.

*Table 1. ADF and P-P tests results*

| Variable | Deterministic component | ADF (lag length) | P-P |
|---|---|---|---|
| Seasonally adjusted | | | |
| LGDP | Intercept and trend | -2.17(0) | -2.07 |
| LNOFTOUR | Intercept and trend | -3.73(0) | -2.81 |
| First difference | | | |
| LGDP | Intercept and trend | -11.70(0)* | 11.69* |
| LNOFTOUR | Intercept and trend | -10.74(0)* | -10.88* |
| Non- Seasonally adjusted | | | |
| LGDP | Intercept and trend | -1.99(4) | -2.28 |
| LNOFTOUR | Intercept and trend | -2.90(4) | -2.32 |
| LER | Intercept | -1.54(2) | -1.42 |
| First difference | | | |
| LGDP | Intercept and trend | -4.18(3)* | -22.62* |
| LNOFTOUR | Intercept and trend | -12.69(1)* | -18.08* |
| LER | Intercept | 7.37(1)* | -6.39* |

*Source: Autors*

Given that the observed variables are integrated of order one, the Johansen (1995) cointegration test is applied in this study. The analysis is conducted through two models. In the first model, the relationship between seasonally adjusted data approximating economic growth and tourism demand is examined, while the exchange rate is excluded from this specification due to the absence of a pronounced seasonal component in its dynamics. In the second model, the relationship is analyzed using non-seasonally adjusted data. Prior to the application of the cointegration test, an appropriate VAR model was estimated in both cases, specifically a VAR(2) specification. Diagnostic analysis confirms that no autocorrelation of residuals is present, that the residuals are normally distributed, and that system stability is ensured, as all inverse roots of the characteristic polynomial lie within the unit circle (results are available upon request). In addition, appropriate dummy variables are included in order to account for structural breaks over the observed period.

The cointegration rank is determined using both the trace statistic and the maximum eigenvalue statistic. The results reported in Table 2 reveal the presence of one cointegrating vector at the 5% significance level in both estimated models. This finding confirms that a stable long-term equilibrium relationship exists between economic growth and tourism, regardless of whether seasonally adjusted or non-seasonally adjusted data are used.

*Table 2. Johansen Cointegration Test Results*

| Model with seasonally adjusted data (except for the exchange rate): LGDP LNOFTOUR LER; Deterministic components: V2020_Q01 V2020_Q02; VAR(2); Lag length (k-1) | | | | |
|---|---|---|---|---|
| Null hypothesis | Trace statistic | Critical value (5%) | Max-Eigen value | Critical value (5%) |
| $H_0$: r=0 | 47.65 | 29.80 | 38.77 | 21.13 |
| $H_0$: r=1 | 8.88 | 15.49 | 6.82 | 14.26 |
| $H_0$: r=2 | 2.06 | 3.84 | 2.06 | 3.84 |
| Model with non- seasonally adjusted data (except for the exchange rate): LGDP LNOFTOUR LER; Deterministic components: V2020_Q02 V2020_Q03; V2020_Q04; VAR(2); Lag length (k-1) | | | | |
| Null hypothesis | Trace statistic | Critical value (5%) | Max-Eigen value | Critical value (5%) |
| $H_0$: r=0 | 155.98 | 29.79 | 146.63 | 21.13 |
| $H_0$: r=1 | 9.35 | 15.49 | 6.97 | 14.26 |
| $H_0$: r=2 | 2.38 | 3.84 | 2.38 | 3.84 |

*Source: Authors*

By applying the Toda–Yamamoto procedure and the modified Wald (MWald) test, potential Granger non- causality between the observed variables is examined. The results of the Toda–Yamamoto test are presented in Table 3, with the focus exclusively on the variables of interest, while the results related to their relationship with the exchange rate are not reported, as they are not the subject of this analysis.

*Table 3. i Toda-Yamamoto results*

| Null hypothesis | $\chi^2$ | Probability | Causality direction |
|---|---|---|---|
| Seasonally adjusted model | | | |
| LNOFTOUR does not cause LGDP | 24.72 | 0.00 | LGDP→LNOFTOUR |
| LGDP does not cause LNOFTOUR | 5.94 | 0.04 | LNOFTOUR→LGDP |
| Non- Seasonally adjusted model | | | |
| LNOFTOUR does not cause LGDP | 15.16 | 0.00 | LGDP→LNOFTOUR |
| LNOFTOUR does not cause LGDP | 10.05 | 0.00 | LNOFTOUR→LGDP |

*Source: Authors*

The obtained results for Model 1 and Model 2 indicate the existence of a bidirectional Granger causal relationship between economic growth and tourism. At the 1% significance level, it is confirmed that causality runs from economic growth to tourism, as well as from tourism to economic growth. Based on the reported p-values, there is sufficient statistical evidence to

reject the null hypothesis of no causality and to accept the alternative hypothesis of mutual causality between the observed variables.

These findings further confirm that tourism and economic growth in the Republic of Serbia are strongly interrelated, with their relationship operating in both directions. This indicates the presence of a mutually reinforcing dynamic between these two sectors, which has important implications for understanding their role in long-term economic development.

## *CONCLUSION*

The objective of this paper was to analyze the tourism-growth relationship in the case of the Republic of Serbia using time series analysis methods. The empirical findings confirm the existence of a stable long-run tourism-growth relationship, indicating that these variables are interdependent over time and that tourism has significant development potential.

Unlike some previous studies, the results of this paper indicate the presence of bidirectional causality between tourism and economic growth. This implies that the development of the tourism sector stimulates economic growth, while overall economic expansion further encourages tourism development. In this way, a mutually reinforcing relationship between these two variables is confirmed, suggesting that tourism may play a more active role in generating economic dynamics under contemporary conditions than previously observed. However, these results should be interpreted within the context of the structural characteristics of the domestic economy. It cannot be generally concluded that the expansion of the tourism sector automatically contributes to long-term economic growth, especially in economies where its share is relatively limited compared to other sectors. Considering the competitive position of tourism in Serbia, as well as previously identified weaknesses in institutional support and infrastructure, the identified bidirectional relationship reflects potential rather than a fully realized development capacity of this sector.

The policy implications are multifaceted. First, it is essential to ensure institutional stability and transparency, as well as to direct investments toward physical and human capital in order to support sustainable economic growth. At the same time, targeted tourism development policies—such as improving tourism infrastructure, enhancing competitiveness, and strengthening international promotion—can further amplify its positive impact on economic growth. Additional resources generated through economic growth can facilitate further development of the tourism sector, thereby creating a reinforcing cycle between the two.

Overall, the results suggest that there is a stable and bidirectional relationship between tourism and economic growth in the Republic of Serbia, providing a solid empirical basis for designing development policies aimed at strengthening tourism as an important driver of long-term

and sustainable economic growth. However, several limitations should be acknowledged in order to ensure a more balanced academic interpretation of the results. First, the study does not include potentially relevant omitted variables such as institutional quality, investment dynamics, trade openness, and infrastructure development, which may jointly influence both tourism and economic growth. Second, data constraints regarding the length and consistency of time series for Serbia may affect the robustness of long-run estimates and causality inference. Third, the use of aggregate tourism indicator does not capture important structural and qualitative dimensions of tourism development, including regional heterogeneity, and changes in tourism composition. In addition, potential endogeneity between tourism and economic growth cannot be fully excluded despite the applied econometric approach.

Future research could address these limitations by incorporating a richer set of tourism indicators (e.g., tourism expenditure structure, regional tourism development), as well as by applying alternative econometric frameworks such as DOLS, FMOLS techniques, nonlinear specifications, or structural models. Furthermore, a regional decomposition within Serbia or a broader cross-country comparative framework could provide additional insights into heterogeneous effects of tourism on economic growth.

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# УТИЦАЈ ТУРИЗМА НА ЕКОНОМСКИ РАСТ: ЕМПИРИЈСКА АНАЛИЗА НА ПРИМЕРУ РЕПУБЛИКЕ СРБИЈЕ

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**Резиме**

Овај рад истражује однос развоја туризма и економског раста у Републици Србији применом емпиријског приступа заснованог на анализи временских серија. У условима савремене глобализације туризам се издваја као један од динамичнијих сектора светске привреде, имајући значајан допринос бруто домаћем производу, запослености, девизним приливима и развоју повезаних делатности као што су саобраћај, трговина и угоститељство. Иако је Србија током последње деценије забележила раст туристичке активности, емпиријска истраживања која прецизно сагледавају макроекономски значај овог сектора и даље су релативно ограничена.

Циљ истраживања је да се испита да ли туризам представља значајан покретач економског раста у Србији, као и да ли између туристичких показатеља и бруто домаћег производа постоји стабилна дугорочна равнотежна веза. Анализа је заснована на хипотези туризмом вођеног раста, али истовремено узима у обзир и могућност повратног утицаја укупног економског развоја на туристичку активност. У том циљу примењене су економетријске методе анализе временских серија, пре свега коинтеграциони тестови и Гренџеров тест узрочности, при чему су као кључне варијабле коришћени бруто домаћи производ и број туристичких долазака.

Емпиријски резултати потврђују постојање стабилне дугорочне повезаности туризма и економског раста, што указује да промене у туристичким перформансама прате шире макроекономске токове. Поред тога, утврђена је двосмерна узрочност: развој туризма позитивно утиче на привредни раст кроз раст прихода, запослености и међународне тражње, док истовремено виши ниво економског развоја подстиче даље унапређење туристичке инфраструктуре и конкурентности дестинације.

Добијени налази указују да туризам у Србији не представља само пратећу услужну делатност, већ сектор са значајним развојним потенцијалом. Због тога рад наглашава потребу за усклађеним економским и туристичким политикама усмереним ка институционалној подршци, модернизацији инфраструктуре и јачању међународне промоције, како би се додатно оснажио допринос туризма одрживом дугорочном расту.