# Determinants of tourism demand for Western Balkans countries: a system generalized method of moments (GMM) approach

Determinantes da procura turística nos países dos Balcãs Ocidentais: uma abordagem do método generalizado dos momentos (MGM)

Determinantes de la demanda turística en los países de los Balcanes Occidentales: un enfoque basado en el método generalizado de momentos (MGM)

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**ABSTRACT**

This paper's main objective is to investigate some of the most important determinants of tourism demand for Western Balkans countries. In this regard, a system generalized method of moments model is estimated for a dataset covering 17 relevant source countries over the period from 2010 to 2022. Results reveal that income levels, geographic proximity, and the COVID-19 pandemic significantly influence tourism flows. For instance, higher GDP per capita in source countries positively impacts tourism demand, while the pandemic had a strongly negative effect. These findings contribute to the literature on dynamic tourism demand modelling and offer actionable insights into policymakers to enhance regional tourism strategies.

**Keywords:** Western Balkans, System Generalized Method of Moments, tourism demand, tourism determinants.

**RESUMO**

O principal objetivo deste artigo é pesquisar alguns dos mais importantes determinantes da demanda turística dos países dos Bálcãs Ocidentais. Nesse sentido, um modelo de método de momentos generalizado do sistema é estimado para um conjunto de dados que abrange 17 países de origem relevantes no período de 2010 a 2022. Os resultados revelam que os níveis de renda, a proximidade geográfica e a pandemia de COVID-19 influenciam significativamente os fluxos turísticos. Por exemplo, o PIB per capita mais alto nos países de origem afeta positivamente a demanda turística, enquanto a pandemia teve um efeito fortemente negativo. Essas descobertas contribuem para a literatura sobre modelagem dinâmica da demanda turística e oferecem percepções práticas aos formuladores de políticas para aprimorar as estratégias regionais de turismo.

**Palavras-chave**: Bálcãs Ocidentais, Método dos Momentos Generalizado Sistêmico, demanda turística, determinantes do turismo.

**RESUMEN**

El objetivo principal de este trabajo es investigar algunos de los determinantes más importantes de la demanda turística de los países de los Balcanes Occidentales. A este respecto, se estima un modelo de método generalizado de momentos para un conjunto de datos que abarca 17 países de origen relevantes durante el periodo comprendido entre 2010 y 2022. Los resultados revelan que los niveles de renta, la proximidad geográfica y la pandemia COVID-19 influyen significativamente en los flujos turísticos. Por ejemplo, un mayor PIB per cápita en los países de origen influye positivamente en la demanda turística, mientras que la pandemia tuvo un efecto fuertemente negativo. Estas conclusiones contribuyen a la bibliografía sobre la modelización dinámica de la demanda turística y ofrecen a los responsables políticos ideas útiles para mejorar las estrategias turísticas regionales.

**Palabras clave**: Balcanes Occidentales, método generalizado de los momentos, demanda turística, factores determinantes del turismo.

# INTRODUCTION

The Western Balkan (WB) region consists of Albania, North Macedonia, Bosnia and Herzegovina, Montenegro, Kosovo and Serbia. The European Union (EU) has supported the gradual integration of WB countries with the Union. Albania, North Macedonia, Bosnia and Herzegovina, Montenegro and Serbia have candidate country status, whereas Kosovo submitted its application for EU membership in 2022. All the WB countries have a perspective to enter the EU and hence they are also called 'enlargement countries'.[1] Tourism demand plays a fundamental role in the economic development in the Western Balkans (WB). Despite its significance, only a limited number of research papers focus on the dynamic determinants of tourism demand specific to WB countries. This study addresses this gap by exploring key factors such as income levels, geographic proximity, and the impact of the COVID-19 pandemic using a system GMM approach.

According to Eurostat data, there were more than 209.000 bed places in hotels and similar establishments in the WB in 2021. The number of bed places provides one of the most important measures of a country's capacity to attract international tourists. The number of bed places in hotels and similar establishments in 2021 was 12.1 million across the EU countries. The largest capacity of the WB region was found in Albania with 85.000 bed places, corresponding to nearly 41% of the total, whereas the second highest was found in Serbia (53.000; 25 %). The capacity of bed places was smaller in Bosnia and Herzegovina (33.000), North Macedonia (24.000), and Kosovo (12.000).[2] International tourist arrivals followed generally a positive trend for WB countries, except for the years 2020 and 2021, when the Covid-19 pandemic spread worldwide. Figure 1 shows the number of international inbound tourists for the six WB countries during the year 2022. Albania had the highest number of overseas visitors (nearly 7,5 million), followed by Montenegro (2,18 million) and Serbia (1,77 million).

**Figure 1**. International Inbound Tourists (in millions) in 2022.
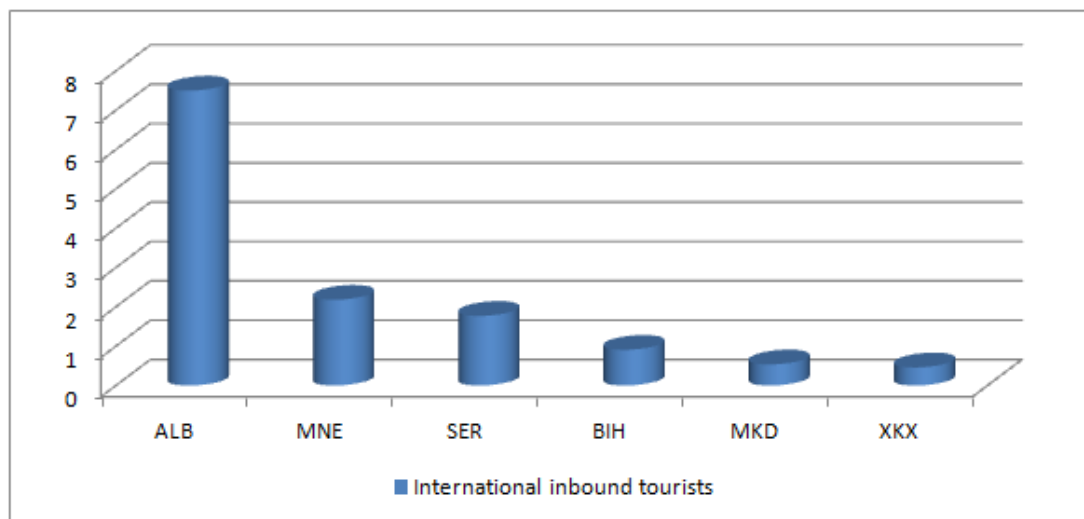


**Source***: Own elaboration based on data from the respective statistical offices (2024).*

This article aims to investigate some of the most relevant determinants of international tourism flows to WB countries. In this regard, a dynamic panel model is applied to a dataset covering 17 important origin countries from 2010 to 2022. The remainder of the article is structured as follows. Section 2 presents an overview of the most relevant studies which have followed a dynamic specification to explore the determinants of international tourist arrivals. Section 3 describes the proposed framework and reports the empirical results. Section 4 concludes and provides some future research directions.

## Literature review

A vast amount of literature has emerged on the relationship among international tourism demand and the corresponding determinants. The main variables that may impact the number of international tourists in each country include incomes per capita, investments in infrastructure, relative prices, climate, political stability, level of security, etc. (see, for example, Eilat and Einav, 2004; Wamboye et al., 2020; Tavares and Leitao, 2017; Shafiullah et al., 2019; Cho, 2010; Ibragimov, et al., 2022). Existing research highlights various determinants of tourism demand, such as income, relative prices, and infrastructure. However, only a small number of studies employ dynamic panel models for WB countries, overlooking causal

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[1] See, for example, https://www.consilium.europa.eu/en/policies/enlargement/

[2] See https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Enlargement_countries_-_tourism_statistics&oldid=627762.

relationships between tourism demand and explanatory variables like geographic proximity and pandemic-related disruptions. The present study bridges some of these gaps by incorporating dynamic modeling techniques, such as system GMM, providing nuanced insights into tourism demand drivers in the WB region. According to Gallego et al. (2019), tourism regressions suffer from endogeneity, including dependence on the past and reverse causality, closely related to the characteristics of the sector, which cast serious doubt on the "standard techniques" such as the Ordinary Least Squares (OLS). The authors demonstrate the utility of the system generalized method of moments (System GMM) on a practical application with 187 airlines. The same estimation technique has been employed by a limited number of tourism researchers. For instance, Lim and Zhu (2018) analyze the impact of meetings, incentive, conventions, and exhibitions (so-called MICE) on tourism demand for Singapore for a 10-year period. The authors use the Difference and System GMM estimators for dynamic panel equations. Tourism demand is estimated through tourist arrivals from the most important 30 source countries. The regressions results show that tourism demand is positively related to the MICE variable, relative prices, and lagged tourist arrivals. Konstantakopoulou (2022) focuses on the effect of health quality on the number of international tourists. The author argues that health quality in destination countries plays a key role in shaping tourist decisions and choices. The analysis is carried out through a system GMM estimation model on 39 developed and 44 developing countries during the years from 2000 to 2016. The respective empirical results show that health quality has a statistically significant effect on international tourism receipts. Furthermore, government health expenditure for developed economies has a weak positive effect, whereas the prevalence of undernourishment in developing economies has a strongly negative effect on international tourism receipts.

Garín-Mun (2006) formulates a dynamic equation for international tourism demand to Canary Islands. The author considers a panel dataset of 15 important origin countries during the period from 1992 to 2002. The "preferred" estimation technique in this case is GMM-DIFF, as proposed by Arellano and Bond in 1991. The econometric results indicate that tourism demand to the selected destination should be seen as a luxury good and is strongly dependent on travel costs and relative prices. Leitão (2009) explores the impact of economic variables on the international demand for tourist services in Portugal. The author estimates a dynamic model on a panel dataset of 15 European countries during the years 1995-2003. The respective empirical results show that tourism demand is explained by relative prices and government spending, and geographical distance. Tang (2018) investigates the effect of institutions and governance on tourism demand for Malaysia through a dynamic panel data model for 45 origin countries during the years from 2005 to 2015. The respective empirical results suggest that institutions play a crucial role in explaining inbound tourism. Furthermore, the authors find that the number of international tourists is highly dependent on governmental effectiveness, political stability, laws, regulations, and corruption. Liu et al. (2018) consider a dynamic panel data model for the top 50 destinations for Chinese tourists over the time period 2002-2013. The respective estimation results reveal that economic variables, including tourism prices, income, and exchange rates have a statistically significant effect on outbound tourism volume. Nguyen and Nguyen (2021) investigate the role of infrastructure, foreign direct investments, private investments, and political stability in stimulating tourism demand for 10 ASEAN countries over a period of 17 years. The authors apply the GMM estimation method and confirm the statistical significance of the considered independent variables. Tang and Lau (2021) also apply the GMM method to investigate empirically how tourism demand for Malaysia from 45 source countries responds to a group of determinants. According to the econometric estimation, tourism demand can be explained by economic factors, such as income and prices, as well as political stability, climate change, and word-of-mouth.

## METHODS

We present in this section the adopted methodological framework and discuss the respective empirical results. Let's initially consider a standard panel data equation with i = 1, . . . , N and t = 1, . . . , T:

$$y_{it} = \alpha_0 + x_{it}'\alpha + \varepsilon_{it} \quad (1)$$

Where $x_{it}$ is a K-dimensional vector of explanators, $\alpha_0$ is the model intercept, $\alpha$ is a (K x 1) vector of slopes, and $\varepsilon_{it}$ is an error term. We control for individual unobserved heterogeneity by decomposing the term $\varepsilon_{it}$ in:

$$\varepsilon_{it} = \lambda_i + u_{it} \quad (2)$$

As a result, equation (1) can be rewritten as:

$$y_{it} = \alpha_0 + x_{it}'\alpha + \lambda_i + u_{it} \quad (3)$$

Where $u_{it}$ is independent and identically distributed (iid) term with zero mean and constant variance; and $\lambda_i$ captures the unobserved individual factors. Under a fixed effects equation, $x_{it}$ and $u_{it}$ are assumed to be uncorrelated. Whereas, under a random effects equation, $\lambda_i$ is assumed to follow a normal distribution with zero mean and constant variance. In the latter case, we can include time invariant variables in the equation.

The inclusion of a lagged independent variable is well suited to capture the dynamic nature of the response variable. Thus, we consider the following dynamic panel data model:

$$y_{it} = \alpha_0 + \rho y_{i,t-1} + x_{it}'\alpha + \lambda_i + u_{it} \quad (4)$$

Where $|\rho|<1$. According to Nickell (1981), standard estimation methods can lead to biased coefficients in dynamic models. Nickell (1981) considers the following equation, where the fixed effect is eliminated, and time effects are omitted:

$$y_{it} - y_i = \rho(y_{i,t-1} - y_{i,-1}) + (x_{it} - x_i)'\alpha + (u_{it} - u_i) \quad (5)$$

Arellano and Bond (1991) argue that the lag of the response variable is often correlated with the individual effects of random errors, thereby causing endogeneity. The authors suggest a GMM estimation technique for deriving the respective moment conditions using instrumental variables. However, this estimator suffers from a weak instrument problem when $\rho$ is relatively high. Blundell and Bond (1998) formulate the System GMM model, where lagged levels in the differenced equation, and lagged first-differences in the levels equation are employed as instrumental variables.

The number of authors who have followed a System GMM technique to investigate the relationship between tourism and the respective determinants is relatively small (see, for example, Konstantakopoulou, 2022; Lim and Zhu, 2018). The relationship between international tourism demand for WB countries and the respective explanators can be expressed through the following dynamic equation:

$$\ln T_{ijt} = \alpha_0 + \rho \ln T_{ij,t-1} + \alpha_1 \ln INC_{it} + \alpha_2 \ln INC_{jt} + \alpha_3 GEO_{ij} + \alpha_4 D_{2020} + \alpha_5 D_{2021} + \alpha_6 BOR_{ij} + \lambda_i + u_{it} \quad (6)$$

Where $T_{ijt}$ denotes international tourist arrivals from source i to WB country j at year t; $INC_i$ is the GDP per capita in source i and $INC_j$ is the GDP per capita in destination j; GEO is the bilateral (geographical) distance; BOR is a dummy variable equal to unity if countries share a common border; $D_{2020}$ and $D_{2021}$ are dummy variables related to the years 2020 and 2021 when Covid-19 pandemic impacted the world. Tourist arrivals data have been obtained from Eurostat, the respective national statistical offices, and other national state institutions. The GDPs per capita have been sourced from the World Bank. The dataset used in the article consists of a panel of 1.326 annual observations for the period from 2010 through 2022. Table 1 presents the list of origin and destination countries included in the analysis, while Table 2 provides the calculation of basic descriptive statistics for the selected variables.

**Table 1.** List of the countries included in the dataset

| | |
|---|---|
| **Western Balkan countries (destinations)** | *Albania, Bosnia and Herzegovina, Montenegro, Kosovo, North Macedonia, Serbia.* |
| **Tourist origin countries** | *Austria, Bulgaria, Belgium, France, Croatia, Greece, Germany, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Turkey, United Kingdom, United States.* |

**Note.** Classification defined by the authors

**Table 2**. Basic descriptive statistics

| VARIABLE | T_ijt | INC_it | INC_jt | GEO_ij |
|---|---|---|---|---|
| *Mean* | 56,719.241 | 32,758.518 | 4,965.564 | 1,379.438 |
| *Median* | 27,620.000 | 32,040.000 | 4,955.000 | 1,318.227 |
| *StdmDeviation* | 858.793 | 163.126 | 11.023 | 70.346 |
| *Variance* | 737526.087 | 26609.945 | 121.510 | 4948.518 |
| *Coefficient of variation* | 1.514 | 0.498 | 0.222 | 0.510 |
| *Asymmetry* | 3.513 | 0.043 | 0.097 | 0.126 |
| *Kurtosis* | 14.711 | -1.509 | -0.829 | -0.984 |

**Note.** Authors' estimates based on the research data

### Estimations and discussion

Table 3 shows the estimation results for the one-step and two-step System GMM panel models. The estimated coefficients have the expected signs and are significant at the 5% level or better in both models, leading to the rejection of the null hypothesis. Following the previous literature, the lagged response variable captures the impact of 'habit persistence' or the 'word of mouth' (Liu, 2020). The negative coefficients of the "2020 and 2021 dummies" indicate the devastating impact of COVID-19 pandemic on the tourism industry. As expected, the parameters of bilateral distance and of the "common border" dummy are both statistically significant. Geographical distance plays a crucial role in explaining tourism demand for WB countries. The negative coefficient of bilateral distance and the positive impact of a shared border are consistent with the studies of Leitão (2009) and Gallego et al. (2019). These authors emphasize that proximity usually reduces travel costs, and as a consequence, increases tourism flows. Furthermore, higher GDPs per capita in source and destination countries stimulate the number of tourists in the WB region. This finding aligns with previous studies, such as Liu et al. (2018), who found that economic factors significantly affect outbound tourism volume in Chinese markets. Comparably, Konstantakopoulou (2022) demonstrated a similar relationship in the context of health quality, other economic variables, and tourism demand. This consistency suggests that income-driven tourism demand can be considered a "universal trend" across different countries and regions. Generally, the empirical results are consistent with previous estimations in the literature. (Gallego et al., 2019; Lim and Zhu, 2018; Liu et al., 2018; Tang and Lau, 2021).

The table also includes the p-values of serial correlation and over-identification tests. The Hansen test results imply the acceptance of the null hypothesis, therefore the GMM estimator's instruments are valid. On the other hand, the Arellano–Bond tests show the absence of serial correlation of order two, suggesting that the employed estimation technique is appropriate for the considered dataset. Comparing these results with other relevant articles, the findings align with the broader literature while offering interesting regional-specific insights. These results underscore the importance of policy interventions to enhance income-driven tourism flows and mitigate pandemic-related disruptions, providing a roadmap for sustainable tourism development in WB countries.

**Table 3**. Model estimation results

| Dependent variable: Δ lnTijt | | | | | |
|---|---|---|---|---|---|
| **Explanatory variable** | **One-step SGMM** | **Pr(>\|t\|)** | **Two-step SGMM** | **Pr(>\|t\|)** | **Expected sign** |
| **Δ lnTij,t-1** | 1.3101 | 1.01e-11*** | 1.2263 | 1.26e-15*** | positive |
| **Δ lnINCit** | 0.8624 | 0.0001*** | 0.7194 | 1.44e-19*** | positive |
| **Δ lnINCjt** | 0.3035 | 0.0346** | 0.2269 | 0.0475** | positive |
| **Δ lnGEOij** | -1.7396 | 0.0001*** | -1.6295 | 0.0001*** | negative |
| **D2020** | -1.4194 | 1.01e-28*** | -1.3936 | 1.83e-32*** | negative |
| **D2021** | -0.2053 | 0.0011*** | -0.3763 | 0.0428** | negative |
| **BOR** | 1.4936 | 0.0002*** | 1.4296 | 0.0026*** | positive |
| **AR(1)** | 0.0031 | | 0.0001 | | |
| **AR(2)** | 0.5935 | | 0.6194 | | |
| **Hansen test** | 0.6992 | | 0.7016 | | |

**Note**: 'Pr(>|t|)' indicates the test p-value. '***', '**', '*' indicate statistical significance at 1%, 5% and 10% level, respectively. AR(1) and AR(2) show the p-values of the Arellano–Bond test for the first-order autocorrelation, and second-order correlation, respectively.

## FINAL REMARKS

Tourism plays a vital role in the economies of WB countries, contributing significantly to income, employment, and infrastructure development. The WB region is renowned for its rich cultural heritage, vibrant cities, stunning landscapes, and culinary experiences, making it a popular destination for both European and non-European travellers. The influx of international tourists brings in revenue through accommodation, transportation, dining, and other services. The revenues directly contribute to the country's GDPs, encourage business activity, and creates employment opportunities. The main objective of this study was the investigation of some of the most relevant determinants of tourism demand for WB countries. In this respect, a system GMM model was estimated for a dataset covering 17 important source countries over the period 2010-2022. The formulated equation included the lagged response variable, bilateral distance, two dummy variables related to the COVID-19 pandemic, per capita incomes in source and destination countries, and another dummy variable for geographic adjacency. The estimation results indicated a good fit of the estimated model to the considered dataset.

This study offers some important empirical novelties by focusing specifically on the WB region, which has been underrepresented in tourism studies. The dynamic relation between income, proximity, and external shocks, such as COVID-19 pandemic, provides a nuanced understanding of regional tourism demand. Theoretically, our results underscore the importance of including dynamic and some other region-specific factors when analysing the number of international tourists.

On the other hand, this study has several limitations. The regional focus on WB countries restricts the generalizability of findings to other countries and regions. Moreover, data availability and consistency from the respective national statistical sources pose potential constraints on robustness. Future research could overcome these limitations by incorporating broader datasets, additional independent variables, and alternative estimation techniques. Understanding the determinants of tourism is crucial not only for researchers, but also for policymakers and industry stakeholders.

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**Contribution of each author to the manuscript:**

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|---|---|---|---|
| | A1 | A2 | A3 |
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| B. data research and statistical analysis: | 40% | 30% | 30% |
| C. elaboration of figures and tables: | 40% | 30% | 30% |
| D. drafting, reviewing and writing of the text: | 40% | 30% | 30% |
| E. selection of bibliographical references | 40% | 30% | 30% |
| F. Other (please indicate) | - | - | - |

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There is no conflict of interest