GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XV, vol. 44, no. 4, 2022, p.1397-1402
DOI 10.30892/gtg.44426-958

THE IMPACT OF COVID-19 ON THE TOURISM SECTOR IN BOSNIA AND HERZEGOVINA

Amir IMERI
University for Business and Technology, Faculty of Economics, Pristina, Kosovo, e-mail: amir.imeri@ubt-uni.net

Luis A. GIL-ALANA*
University of Navarra, Faculty of Economics, Pamplona, Spain;
Universidad Francisco de Vitoria, Facultad de Ciencias Juridicas y Empresariales, Madrid, Spain, e-mail: alana@unav.es

Citation: Imeri, A., & Gil-Alana, L.A. (2022). THE IMPACT OF COVID-19 ON THE TOURISM SECTOR IN BOSNIA AND HERZEGOVINA. *GeoJournal of Tourism and Geosites*, 44(4), 1397–1402. https://doi.org/10.30892/gtg.44426-958

Abstract: In this study, we examine the degree of persistence in tourism in Bosnia and Herzegovina and the impact that the COVID-19 pandemic has had on it. The series investigated are foreign arrivals and overnight stays for the time period from January 2008 to December 2021. The methodology used is based on fractional integration. The results indicate that the impact of COVID-19 has been strong on the series, removing the significance of the time trend, increasing the level of persistence and reducing significantly the seasonality factor in both arrivals and overnight stay series.

Key words: Bosnia and Herzegovina, fractional integration, non-parametric technique, persistence, tourism

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INTRODUCTION

Since it started, the COVID-19 pandemic has had an impact on all sectors in the economy including, above all, the tourism sector. Each country, with its own strategies for a COVID-19 exit, tried to give economic support to citizens and organizations as well as to carry out actions to control the extent of the pandemic. The impact in the tourism sector manifested itself in a decrease in the number of foreign tourist arrivals and overnight foreign tourist stays by 74% globally during the year 2020 compared to the year 2019. This drop was as a result of travel limitations for foreign tourists. Consequently, there were major financial implications, including export revenues decreasing by about USD1.3 trillion globally which was more than eleven times worse compared to the last economic crisis in 2009 (UNWTO, 2021).

Accordingly, this study analyzes if the components of time series linked with foreign tourist arrivals and overnight foreign tourist stays in the case of Bosnia and Herzegovina have changed during the period of COVID-19. Bosnia and Herzegovina, also known as Bosnia, is located in the Balkans region at the crossroads of south and southeast Europe. It is not fully landlocked since in the south it has a narrow coastline of about 20 km on the Adriatic Sea. Tourism in Bosnia has increased significantly in recent years. This is shown in the highlights of United Nationals World Tourism Organization (2018), which ranks Bosnia in first place among the fastest developing tourist destinations in Europe, registering 14% year-on-year growth in 2018 while in 2019, Bosnia and Herzegovina registered the highest number of foreign tourist arrivals, reaching 1.2 million and the number of foreign tourist overnight stays were 2.4 million (Agency for Statistics of Bosnia and Herzegovina, 2022a). According to the World Bank data (2022), the tourism sector comprises about 6.3% of the country's export revenues for the year 2021. Additionally, Bosnia and Herzegovina is perceived as being one of those nations with the possibility of being among the 8 fastest growing tourist destinations in Europe (World Atlas, 2019).

According to the Agency for Statistics of Bosnia and Herzegovina (2022b) the share of tourism in gross domestic product (given in vertical axis) has undergone a small decreasing trend in the period 2000-2019, recording only 2.08% in 2019, reflecting a very low contribution to the economic development of Bosnia and Herzegovina (Figure 1).

The new Covid-19 pandemic is still advancing and can currently be found in 224 countries and territories in the world (Worldmeters, 2022). In Bosnia and Herzegovina, the first positive cases of COVID-19 were identified on March 5, 2020 and the pandemic is still progressing (Arapovic and Skocibusic, 2020). As in other countries, in Bosnia and Herzegovina the pandemic had an impact on both the population and the economy and this led to certain measures being introduced by the government such as various types of financial support to certain categories of citizens and companies. Additionally, part of the measures including the emergency situation, a lockdown and restrictions in movements of people were imposed in late March 2020. With the purpose of helping the affected residents, part of the government support was earmarked to cover salaries and their social security contributions for specific sectors, giving vouchers for accommodation, controlling prices, decreasing rental leases, facilitating reimbursement in loans and subsidizing health sector expenditure (OECD, 2021).

Similarly, additional support was given to affected sectors including tourism sectors by allocating vouchers for accommodation for about 50 Euro per person to be spent on domestic tourist facilities (OECD, 2020). Because of the COVID-19 pandemic, the tourism sector suffered severely from a decrease in the number of foreign tourists in Bosnia and Herzegovina. There is a remarkable gap in forecasting its future impact of COVID-19 on Bosnian tourism. This sparked interest and is the

* Corresponding author

objective of the article to explore the level of persistence from the COVID-19 pandemic in the tourism sector in Bosnia and Herzegovina. Therefore, the article tries to answer the subsequent research questions: did the level of tourism persistence in Bosnia and Herzegovina for foreign tourist arrivals and overnight foreign tourist stays changed during COVID-19? In other words, the aim of the paper is to examine the degree of persistence in the tourism data of Bosnia and Herzegovina by using fractional integration methods and with the aim of determining if shocks in the series have permanent or transitory effects.

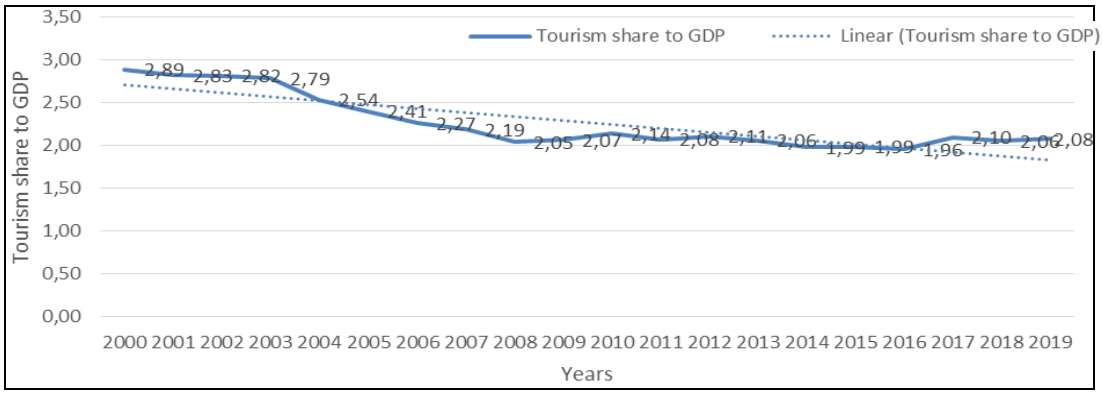


Figure 1. Share of tourism in GDP in % in Bosnia and Herzegovina for 2000-2019
(Source: Built by the authors according to Agency for Statistics of Bosnia and Herzegovina, 2022b)

LITERATURE REVIEW

The global spread of COVID-19 resulted in an increase in studies on its effect on tourism (see Candra and Rekha, 2020; Korinth and Ranasinghe, 2020; Lim and To, 2021; Matiza and Slabbert, 2021; Molinero et al., 2021; Rogerson and Rogerson, 2020; Skare et al., 2021; Williams, 2020; Tellioglu, 2021). Additionally, many studies claim that the COVID-19 pandemic changed positively the market behavior in general, and more specifically brought the transformation of tourism in the planet (see Abbas et al., 2021; Alkhawaldeh, 2022; Donthu and Gustafsson, 2020; Kinczel and Müller, 2022; Lew et al., 2020; Sharma et al., 2021). Whereas some researchers have concluded that COVID-19 has brought new possibilities so that tourism sector can be reorganized and more sustainable as a substitute for the traditional growth model as had previously been practiced (see Deb and Ahmed, 2022; Desbiolles, 2021; Ertac and Cankan, 2021; Florencio et al., 2021; Grandi et al., 2022; Sobaih et al., 2021). Additionally, the changes in tourism sector from COVID-19 have been analyzed widely, there have been very few studies that have investigated the impact of Covid-19 in the level of persistence in tourism industry (see Payne et al., 2021; Gil-Alana and Poza, 2020; Yucel et al., 2022).

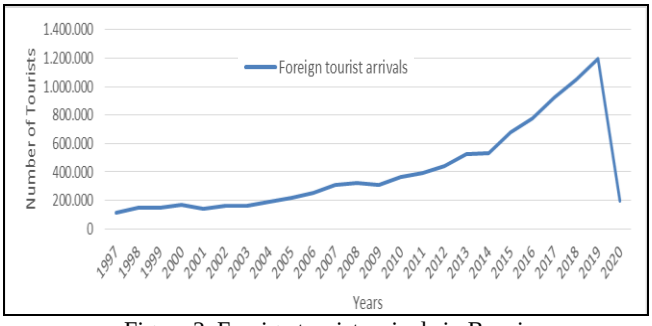


Figure 2. Foreign tourist arrivals in Bosnia and Herzegovina (1997 – 2020) (Source: Built by the authors according to World Bank data, 2022)

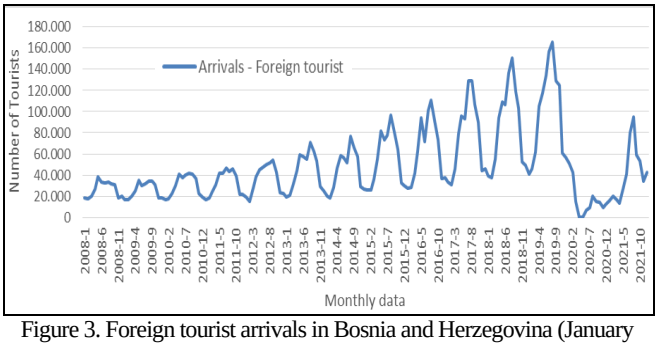


Figure 3. Foreign tourist arrivals in Bosnia and Herzegovina (January 2008 - December 2021) (Source: Built by the authors according to Agency for Statistics of Bosnia and Herzegovina, 2022a)

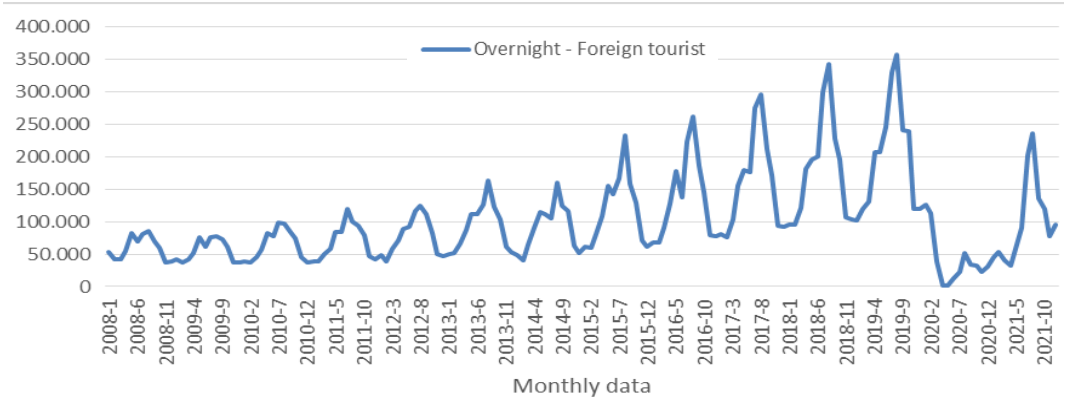


Figure 4. Foreign overnight stays in Bosnia and Herzegovina (January 2008 - December 2021)
(Source: Built by the authors according to Agency for Statistics of Bosnia and Herzegovina, 2022a)

The repercussions of shocks, be they short or long lasting, created by the level of persistence are significant for all parties involved in tourism sector with the purpose of improving the situation and increasing the number of foreign tourists.The level of persistence estimates the range of transformation where current economic situation influences long-lasting transformation. Under the expectation when the results of the study show a negative short-lasting shocks, it is not necessary to make drastic changes in policies, while if results show a negative shock as long-lasting than it is necessary to implement major changes in policies of the country. The research of Payne et al. (2021) for Croatia shows a decline in both the number of foreign tourist arrivals and overnight foreign tourist stays and an increase in the degree of persistence in tourism indicators because of the shock of the COVID-19 pandemic in spite of the fact that the new pattern evolved at a much lower level when compared with the pre-pandemic pattern for the predefined tourism indicators. Similar outcomes are found also by Gil-Alana and Poza (2020) showing huge impact of Covid-19 in tourism sectors in Spain, where the degree of persistence resulted to be high, that shifted from transitory, short lasting shocks in the period before the pandemics to long lasting shocks during the pandemic Covid-19. However, as far as we know, there are no studies using fractional integration in the analysis of tourism in Bosnia and Herzegovina or investigating the impact of COVID-19 on the persistence on tourism-related series in this country. These represent the principal commitments of the study.

MATERIAL AND METHODS

In an endeavor to examine the level of persistence changes in the tourism industry in Bosnia and Herzegovina, monthly data for foreign tourist arrivals and foreign tourist overnight stays were used. The data were attained from the Agency for Statistics of Bosnia and Herzegovina and stretch from January 2008 to December 2021. They show the robust negative relationship of COVID-19 with foreign tourist arrivals and foreign tourist overnight stays in Bosnia and Herzegovina, a relationship that is reflected in Figures 2, 3 and 4. Figure 2 displays annual data from 1997 until 2020, published by the World Bank (2022), reaching an all-time high in 2019, with about 1.2 million foreign tourist arrivals and a record low of 197,000 in 2020. Figures 3 and 4 show respectively monthly data for foreign tourist arrivals and foreign overnight stays from January 2008 until December 2021, reaching a historical high of 165,000 foreign tourist arrivals and 358,000 overnight stays in August of 2019 and falling to an all-time low of 268 foreign tourist arrivals in April of 2020 and 1,670 overnight stays in May of 2020. With regard to the methodology and with the purpose of studying the level of persistence in tourism for foreign tourist arrivals and overnight stays, the following fractional integration model (Granger, 1980; Granger and Joyeux, 1980; Hosking, 1981) is used:

$$(1-L)^d z_t = u_t, \qquad t = 1, 2, \ldots, \tag{1}$$

where L represents the lag operator, i.e., $L^k x_t = x_{t-k}$, and where u_t is supposed to be at most a weakly dependent process, e.g., ARMA. To allow for some deterministic terms, and in particular to determine if time trends are present in the data, we suppose that z_t can be the errors in a regression model with an intercept and a linear time trend, i.e.,

$$x_t = \alpha + \beta t + z_t, \quad t = 1, 2, \ldots, \tag{2}$$

and given that we use monthly data and seasonality seems to be present, a simple monthly AR (1) process is used for u_t in (1), i.e,

$$u_t = \rho u_{t-12} + \varepsilon_t, \qquad t = 1, 2, \ldots, \tag{3}$$

where ε_t is a white noise process.

Based on the above parameterization (Robinson, 1994), *d* addresses the level of persistence essential in the given time series; x_t stands for the perceived time series (in logs); α represents a constant; β stands for a linear time trend; and the parameter ρ stands for the seasonal AR coefficient. The appraisal method is applied and is created on a basic version of a suggested test of Robinson (1994) for unit root and other non-stationarity hypotheses. This test is further studied by Gil-Alana and Robinson (1997) concluding that the test is proficient and allows any real value of *d* to be tested (see equation 1 above), following the standard N (0,1) limiting distribution. The test is not dependent on the insertion of deterministic situations nor from disturbance situations of seasonal autoregression. The difference with standard unit root tests is with the parameter d, that can have values of 0 that are stationary or 1, which is first-difference stationary, whereas in the fractional integration model, the values of parameter d can vary from 0 until 1, or also can be less than 0 or higher than 1. In the case the value of d turns out to be less than 1, this indicates mean deterioration and the existence of shocks that are temporary in nature. Whereas, if the value of d turns out to be equal or more than 1, it shows the absence of mean deterioration and the existence of shocks that will bring a lasting impact, creating a new trend for the time series.

RESULTS AND DISCUSSION

Based on equations (1), (2) and (3) the examined model is

$$x_t = \alpha + \beta t + z_t; \qquad (1-L)^d z_t = u_t, \qquad u_t = \rho u_{t-12} + \varepsilon_t, \tag{4}$$

where x_t refers to the observed data (in logs). We start by presenting the results with the data ending at December 2019, i.e., a couple of months before the outbreak of the Covid-19 pandemic. Table 1 displays the estimates of d (and in parenthesis, their associated 95% confidence bands) for the three standard cases examined in the unit root literature in connection with the deterministic terms (Bhargava, 1986; Schmidt and Phillips, 1992). Thus, in column 2 we focus on the case where α and β are both set up equal to zero, so no deterministic terms are presented in the model; in column 3 we report the results with β = 0 a priori, so a constant term is only included in the model; finally, in column 4, both coefficients, α and β are estimated from the data along with the rest of the parameters in Eq. (4). We choose the specific model using the t-values of the estimated coefficients, reporting in bold the selected model for each series. In connection with the disturbance term, in panel i) we impose that the seasonal coefficient, ρ, is equal to 0, so u_t is a white noise process; in panel ii) we allow for some degree of autocorrelation by using a non-parametric approach due to Bloomfield (1973) that

approximates AR structures in a way that fits very well in fractionally integrated contexts; finally, in panel iii), seasonality is permitted as in the last equality in equation (4). The same structure holds in Table 2 but includes data ending at December 2021, that is, a further 24 observations which include the present pandemic that has affected the world.

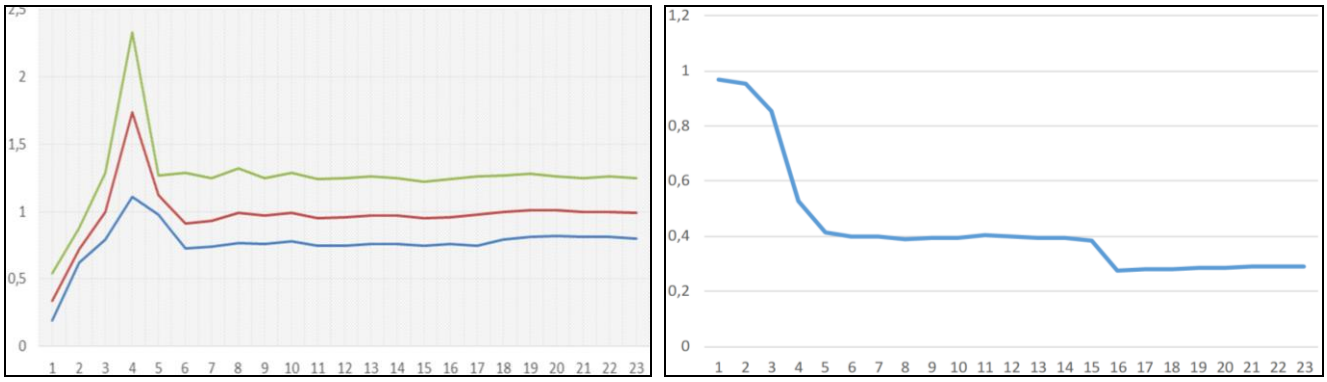
Table 1. Estimates of d with data ending at December 2019 (Source: Built by the authors)

Series ending at December 2019	No terms	A constant	A constant with a time trend
i) White noise errors			
ARRIVALS	0.97 (0.86, 1.12)	**1.27 (1.03, 1.52)**	1.27 (1.03, 1.53)
NIGHTS	0.95 (0.85, 1.10)	**1.18 (0.95, 1.41)**	1.18 (0.95, 1.41)
ii) Bloomfield autocorrelated errors			
ARRIVALS	0.86 (0.70, 1.10)	0.39 (0.26, 1.01)	**-0.24 (-0.51, 1.01)**
NIGHTS	0.87 (0.71, 1.11)	0.42 (0.26, 1.16)	**-0.19 (-0.44, 1.16)**
iii) Seasonal Monthly autocorrelated errors			
ARRIVALS	0.96 (0.84, 1.11)	0.61 (0.56, 0.68)	**0.39 (0.27, 0.55)**
NIGHTS	0.94 (0.83, 1.09)	0.61 (0.55, 0.69)	**0.35 (0.24, 0.49)**

Table 2. Estimates of d with data ending at December 2021 (Source: Built by the authors)

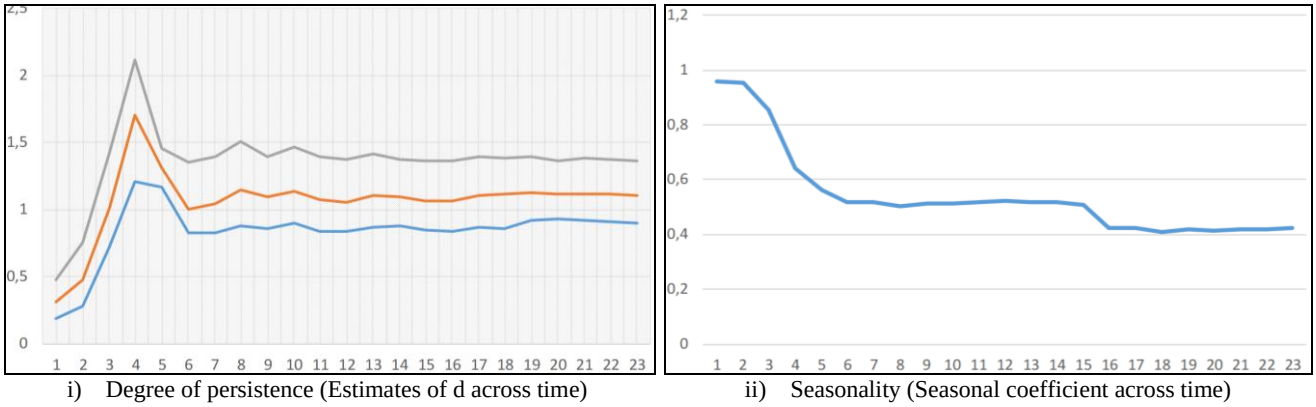
Series ending at December 2021	No terms	A constant	A constant with a time trend
i) White noise errors			
ARRIVALS	1.00 (0.89, 1.15)	**1.02 (0.81, 1.30)**	1.02 (0.81, 1.30)
NIGHTS	0.99 (0.89, 1.13)	**1.12 (0.89, 1.41)**	1.12 (0.89, 1.41)
ii) Bloomfield autocorrelated errors			
ARRIVALS	0.84 (0.67, 1.03)	0.28 (0.12, 0.52)	**0.26 (0.10, 0.52)**
NIGHTS	0.86 (0.70, 1.06)	0.33 (0.18, 0.61)	**0.33 (0.14, 0.61)**
iii) Seasonal Monthly autocorrelated errors			
ARRIVALS	0.99 (0.88, 1.14)	**0.99 (0.80, 1.25)**	0.99 (0.80, 1.25)
NIGHTS	0.98 (0.86, 1.12)	**1.10 (0.91, 1.36)**	1.11 (0.91, 1.36)

The first thing we observe in Table 1 is that the time trend is required in the two series in panels ii) and iii); however, imposing white noise errors (in panel i)), only the intercept is required. Surprisingly, the results vary substantially depending on the assumption made on the error term. Thus, if u_t is white noise (panel *i*), the estimated values of *d* are higher than 1, (1.27 for the arrivals and 1.18 for the overnights) and the unit root null hypothesis, i.e., d = 1 is rejected in the former series in favor of d > 1. If autocorrelation is permitted throughout the model of Bloomfield (1973), what we observe is that the coefficients are now both negative and the I(0) hypothesis of stationarity cannot be rejected; finally, if seasonality is permitted, which is the most realistic assumption based on Figures 3 and 4, the estimated values of *d* are 0.39 and 0.35 respectively for the arrivals and the overnights, and both hypothesis d = 0 and d = 1 are rejected in the two series.



i) Degree of persistence (Estimates of d across time) ii) Seasonality (Seasonal coefficient across time)

Figure 5. Recursive estimates in the logged number of arrivals. (Source: Built by the authors)



i) Degree of persistence (Estimates of d across time) ii) Seasonality (Seasonal coefficient across time)

Figure 6. Recursive estimates in the logged number of nights. (Source: Built by the authors)

Next, we repeat the analysis but this time for the sample including the data of 2020 and 2021. The first thing we observe is that the time trend is now only required for the case of Bloomfield (1973) errors. The unit root null hypothesis (d = 1) cannot be rejected for the case of white noise errors; the estimates of *d* are in the range (0, 1) with Bloomfield, and the estimated values of *d* are close to 1 if seasonality is permitted. In this latter case, the values are 0.99 for the arrivals and 1.10 for the overnights and the unit root null cannot be rejected in either of the two series. Nevertheless, comparing these results with those in Table 1 (panel iii) there is a substantial increase in the values of *d* and thus, in the degree of persistence in the data. In order to further investigate the change in persistence, we re-estimated *d*, starting with the sample ending at December 2019, and then successively adding one observation (month) each time until completing the sample in December 2021. Figure 5 reports in panel i) the estimated values of d (along with the 95% confidence intervals) for the case of the number of arrivals, while panel ii) displays the estimated seasonal AR coefficients for the same subsamples. Figure 6 reports similar values but for the overnight data. The first thing we observe in Figure 5 is that there is a continuous increase in the estimate of *d* during the first four months in 2020. Thus, the estimate of *d* for December 2019 is 0.39 (Table 1) and it increases up to 1.74 in April 2020; then *d* decreases to 1.12 the following month and stabilizes around 1 by August 2019 until the end of the sample. Thus, comparing with pre-Covid values, which were smaller than 0.5 and showing thus mean reversion, the pandemic has substantially increased the estimates of *d* to values around 1, thereby showing a lack of mean reversion. Focusing on the seasonal coefficient, we observe a sharp decrease during the first four months of the 2020 year; subsequently, it stabilizes until March 2021 and then starts decreasing again to a value around 0.3 when it includes the last months in the sample. Looking at the overnights, in Figure 6, the same picture emerges, with an increase in the estimate of *d*, from 0.35 in December 2019 to 1.70 in April 2020, and then decreasing and being stable and slightly above 1 till the end of the sample in December 2021. For the seasonality issue, the same pattern as with the arrivals holds, observing a continuous decrease from values of ρ close to 1 to values slightly above 0.4 in 2021.

CONCLUSIONS

In this study we have explored the impact of the Covid-19 pandemic on foreign tourist arrivals and overnight stays in Bosnia and Herzegovina for the time period from January 2008 until December 2021. We provide an empirical framework for evaluation of persistence in tourism following the Covid-19 pandemic. Confirmation in the wake of time series data assessments demonstrates that the Covid-19 pandemic had negative impacts on the tourism industry which reached a historically low number of foreign tourist arrivals and overnight stays in Bosnia and Herzegovina. Considering the example of the tourism sector of Bosnia and Herzegovina, the conclusions from this study for the data ending at December 2019, i.e., a few months before the Covid-19 pandemic erupted, the value of d is much lower and so the degree of persistence in the data, compared to the data ending at December 2021 that also includes the data of 2020 and 2021, the months when the Covid-19 pandemic reached its peak; show a substantial increase in the values of *d* and thus, in the degree of persistence in the data.

To delve further into the change in persistence, *d* is re-assessed, using the data for number of arrivals until December 2019, and then progressively adding one month each time until December 2021, revealing that, in contrast to pre-Covid values, which were less than 0.5 and thus indicating mean reversion, the Covid-19 pandemic has significantly expanded the d to values around 1, consequently showing absence of mean reversion. Additionally, we notice a sharp fall during the initial four months of the year due to the seasonal coefficient; at which point, it stabilizes until March 2021 and subsequently begins to diminish again to a value of 0.3. Regarding the change in persistence using the data for number of nights, the value of d increased from 0.35 in December 2019 up to 1.70 in April 2020, afterwards diminishing and remaining steady and a little over 1 until the last analyzed observation (month) in December 2021. As for the seasonality issue, this has a similar pattern as the number of arrivals, registering a continual drop from values near 1 to values slightly above 0.4 in 2021. A limitation in this study is that the outcomes allude to Bosnia and Herzegovina and cannot be applied to different neighboring countries that have totally different essentials. These results are reliable with the outcome of preceding studies resulting with the degree of persistence to be high from COVID-19 (Payne et al. 2021, Gil-Alana and Poza, 2020). However, endeavors to combat the spread of the pandemic have concentrated on managing the crisis by moderating the effect on the economy through various forms of government support, there is a need to re-modify the traditional tourism growth model towards a more sustainable one. This recommendation is also given by UNWTO through its sustainable development goals. The study focuses on the persistence of tourism in Bosnia and Herzegovina, hence persistence of tourism in major or regional touristic areas has not yet been answered. Hence, the persistence analysis of tourism covering different cities or regions is left to future investigations. Further area for future work would be the utilization of persistence in monthly tourist spending data in Bosnia and Herzegovina.

Acknowledgement

Luis A. Gil-Alana gratefully acknowledges financial support from the Grant PID2020-113691RB-I00 funded by MCIN/AEI/ 10.13039/501100011033.

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Article history: Received: 12.08.2022 Revised: 21.09.2022 Accepted: 01.10.2022 Available online: 21.11.2022