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Statistical analysis of the type and seasonality of tourist arrivals at a UNESCO sightseeing tourism site: the example of Chernivtsi, Ukraine

Abstract: In this research paper, a statistical analysis of the type and seasonality of arrivals to the former Residence of the Bukovina Metropolitans in Chernivtsi (Ukraine) was carried out. Based on a time series for 2000–2023, types were considered according to such categories as adults, pupils/students and domestic visitors or inbound tourists by country of origin. Each of them was considered over the time series. The results of the analysis allow us to establish the effects of the factors influencing tourist flows on ‘calm’ Chernivtsi in a country at war. Thus, it is possible to see nuances to the influence of threats and dangers on domestic and inbound tourism in Ukraine. The analysis of seasonality, thanks to the location in the mid-latitudes, has made it possible to establish the influence of climate on the distribution of tourism throughout the year. The UNESCO status of the former Residence of the Bukovina Metropolitans increases the value of the research not only due to the analysis, but also due to the primary data to which the authors had exclusive access, as university teachers located on the site. This research paper is a follow-up to that presented in “Methodical approaches and statistical analysis of tourist arrivals to centers of sightseeing tourism (based on the example of Chernivtsi, Ukraine)” (Korol, Krul, Zayachuk & Kostash, 2023).

Keywords: sightseeing tourism and visits; tourism and UNESCO sites; type of visitor by place of origin; age of visitors; seasonality of tourist arrivals

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INTRODUCTION

The city of Chernivtsi is one of the centers of sightseeing tourism in Ukraine with visitors being attracted by the historical center, shaped during its time as part of the Austro-Hungarian Empire. The flow of tourists to this destination sharply increased after Yuriy Fedkovych Chernivtsi National University (in the former Residence of the Metropolitans

of Bukovyna and Dalmatia) was inscribed on the UNESCO World Heritage List on 28 June 2011. In any sightseeing tourism venue, a UNESCO World Heritage Site is a must-see attraction but at the same time, statistical records of tourists may not be kept in such destinations, as for example they have in Chernivtsi. Therefore, the statistical analysis of visitors to the attraction allows us to draw conclusions for sightseeing tourism as a whole, including about the types of arrival and seasonality.

This work represents a continuation of the research presented in the publication “Methodical approaches and statistical analysis of tourist arrivals to centers of sightseeing tourism (the example of Chernivtsi, Ukraine)” (Korol et al., 2023). The previous publication analyzed the dynamics of tour visits to the UNESCO World Heritage site, the former Residence of the Bukovynian Metropolitans, and identified factors that facilitated or, conversely, hindered tourist activity over the 2000–2021 period. The analysis of type and seasonality of these arrivals, including changes, have been carried out in this work.

These two articles pursue both theoretical and applied issues. The latter involves providing the municipal authorities of Chernivtsi with a comprehensive statistical analysis of tourist arrivals to the UNESCO site, giving an idea of changes to the total number, type and seasonality. The study results may be interesting for a comparative analysis of tourist arrivals to other UNESCO sites and it is this status of the research site that makes the article relevant for researchers from other countries. Ultimately, it is unique however because it allows us to follow changes in the types of arrival as a result of Russia’s military aggression in Ukraine. Such a dramatic event had not taken place on the European continent since the Second World War, that is during the period of formation and development of mass tourism.

The theoretical significance of the study is that the analysis of statistical indicators is complemented by an explanation of the types and seasonality of arrivals. These results make it possible to establish the effects of factors that may have a universal influence although based on an individual case.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Given that the statistical analysis of the types and seasonality of tourist arrivals was conducted for a UNESCO-listed site, we are primarily interested in academic inquiries that address an analysis of sightseeing tourist flows, including to sites of world cultural heritage.

Modern trends in the field of sightseeing tourism are highlighted in the article by Timothy (2017), where he focuses on the development of academic approaches to the study of cultural heritage and the expansion of opportunities for the consumption of tourist products. Patuelli, Mussoni & Candela (2013) studied the role of sightseeing tourism in expanding the customer base and diversifying offers.

A separate group includes studies focusing on visitors to UNESCO-listed sites, their behavior, motivation and problems; the typology of consumers is discussed by Adie & Hall (2017).

Seasonality in tourism is a major issue for developed tourist destinations as it causes an uneven distribution of tourist flows throughout the year. Given the importance of this topic, numerous studies have been dedicated to it. In general, all publications on the study of seasonality in the tourism industry can be grouped into specific areas:

- bibliometric analysis of publications over a defined period dedicated to seasonality and tourism forecasting,
- the study of seasonality as a phenomenon, the identification of issues and the search for ways to overcome its negative effects,
- consideration of seasonality in terms of forecasting tourist demand,
- assessment of the impact of seasonality on the competitiveness of tourist destinations,
- methods of measuring tourism seasonality.

A comprehensive theoretical approach to tourism seasonality, the study of its temporal and spatial patterns, and the formulation of clear seasonal profiles that would contribute to the formation of tourism policy and tourism development, were the goals of the research by Krabokoukis & Polyzos (2023). Senbeto & Hon (2019) evaluated current research on tourism seasonality and proposed a dualistic model that deepens an understanding of the impact of various factors in the tourism sector. Andriotis (2005) explores whether seasonality is a problem or simply a way of life for a tourist destination. Butler (2001) develops and tests a methodology for studying its patterns and causes in different parts of a country.

The central problem for the development of tourism in the mass tourism destinations is seasonality, according to Gil-Alana, Gil-López & Román (2021), Senbeto & Hon (2021), Duro (2018), Duro & Turrion-Prats (2017, 2019), Ferrante, Lo Magno & De Cantis (2018), De Cantis, Ferrante & Vaccina (2011), Koenig & Bischoff (2003), Wen et al. (2021), Chen et al. (2019), Saayman & Botha (2017), Liu, Hsiao & Ma (2021), Vergori (2012, 2017), H. Liu et al. (2019), Jiao & Chen (2019), Wang, Hu & Wu (2023), Untong et al. (2015), Fernández-Morales, McCabe & Cisneros-Martínez (2023), Karl, Winder & Bauer (2017). In their publications, the authors focus on the lack of a homogeneous method for measuring seasonality and propose to use various mathematical and empirical models (seasonal decomposition by multiple factors, coefficient of variation, indices, occupancy rate of accommodation facilities, scalar measures, etc.). The majority of researchers (Tsitouras, 2004; Martín, Aguilera & Moreno, 2014; Fernández-Morales, Cisneros-Martínez & McCabe, 2016; Pavlović et al., 2022) consider the Gini coefficient to be a generalized measure of tourism seasonality, adjusted to reference a uniform distribution and producing a 'month's equivalent' degree of seasonality.

The use of a relative climate index (Li et al., 2018) to assess the effect of climate variability on seasonal tourism demand makes it possible to test the intra-annual seasonality and inter-annual variability of a tourist destination.

Koenig & Bischoff (2003) investigate the seasonal demand for different types of domestic tourism and consider various methods of quantifying seasonal fluctuations, while analyzing policy implications for further tackling the seasonality problem. Kennedy (Liz) (1999) sets a similar goal in her study based on the example of different country, conducting a thorough analysis of the improvement of tourism performance and the impact of seasonality. Cuccia & Rizzo (2011) used regression analysis to measure the seasonality of tourist presence in different destinations according to their different degrees of cultural attractiveness.

Research devoted to the impact of Russian aggression in Ukraine on its inbound tourism is also considered. Enikő SASS (2020) in her study deals with Ukraine and shows the concrete or secondary influence of the Russian-Ukrainian "hybrid war" and the events that followed it on the country's tourism. Her article shows the changes that occurred

in tourism based on the available statistical data, specifically comparing the 2013 statistical data, prior to the armed conflict, with those of 2017 characterized by stagnation.

Of great interest is the research into inbound tourism in Ukraine by the Polish academics, Natalia Tomczewska-Popowycz and Łukasz Quirini-Popławski (2021). They determine how political instability influences inbound tourist flows to Ukrainian cities, the performance of tourism-related businesses, and tourism-based profits in general. This study presents the impact of various events on the tourism economy in Ukraine; however, the available secondary data with the unobserved component model procedure give only a general overview of the situation. Thus, interviews were conducted with experts, including managers of accommodation facilities, employees of municipal tourism development departments, and researchers investigating tourism. A total of 69 responses were received. However, this is not enough to draw reliable conclusions.

In general, studies devoted to seasonality in tourism provide an exhaustive analysis of its factors and influence on the tourism industry. However, there is a lack of work on seasonality by type of tourist, namely: sightseeing tourism, at the local level of a destination, and located in the mid-latitudes with pronounced seasons. This study investigates this gap.

Work on the influence of the threat and danger factor to tourism is extremely relevant for Ukraine. Although several works are devoted to this issue, none of them covers 2022–2023 of Russia's war in Ukraine. In addition, this study examines this issue at the local level, which allows us to see the influence of the threat and danger factor within the country, in particular on the redistribution of tourist flows in favor of 'calm' regions. There is also a lack of work that has shown how this factor affects both domestic and inbound tourism in a particular country.

In addition, this study may be interesting to other researchers, as it is devoted to a UNESCO site. This status increases the value of research not only due to the analysis, but also due to the primary data presented, to which the authors had exclusive access as teachers at the university located at this site.

STUDY MATERIALS AND METHODOLOGICAL BASIS

The methodology of tourist analysis based on specially organized statistical research is by sampling which does not provide for coverage of the overall population. Therefore, the task of selecting a research location arises and sites that are necessarily visited by tourists, particularly UNESCO World Heritage sites, can serve as such locations. Additionally, it is necessary to take into account the times of observation, because tourist flows are not constant throughout the year but are seasonal. This means that several surveys should be conducted, at least one for each season; the best option however is to continuously collect such information, and this is possible in the case of sites open to the public on a paid basis.

Thus, we formulate the requirements for the location for observation of visitors to a sightseeing tourism center and apply them to the research situation in the city of Chernivtsi:

- It should be a place with a site that tourists are certain to visit. In Chernivtsi, such a site is the former Residence of the Bukovynian Metropolitans, a part of UNESCO World Heritage. This status ensures that tourists will not miss this attraction, at least on their first visit to Chernivtsi,

- It should be a place that cannot be visited independently which is typical for exhibition sites where access is paid. The former Residence fits this criterion,
- To determine the distribution of visitors by seasons, this place must be accessible to tourists throughout the year. Tours in the former Residence are conducted daily from 10 AM to 5 PM all year, ensuring continuous statistical observation,
- In such a place, in addition to accounting for visitors in physical and monetary terms, other statistical information should be collected to analyze the types of visitor or there should be the possibility of doing so.

Addressing the last requirement, it should be noted that statistical observation at the former Residence is facilitated by the fact that it now houses the main buildings of Chernivtsi National University (CNU). Tours are conducted by staff guides who also carry out statistical accounting by registering tourist groups and individuals in the logbook. They record the daily number of tourists with the following information:

- the number of adults, pupils/students,
- the number of domestic and inbound tourists,
- the countries of origin of inbound tourists.

OBJECTIVES OF THE STUDY

The applied goal is the analysis and explanation of the indicators that characterize the type and seasonality of tourist arrivals to the former Residence of the Bukovynian Metropolitans, which is necessary for planning and organizing tourist activity in the city of Chernivtsi. The UNESCO status of this monument allows us to put forward a theoretical goal: to establish the effect of factors that may have a universal impact based on this individual case.

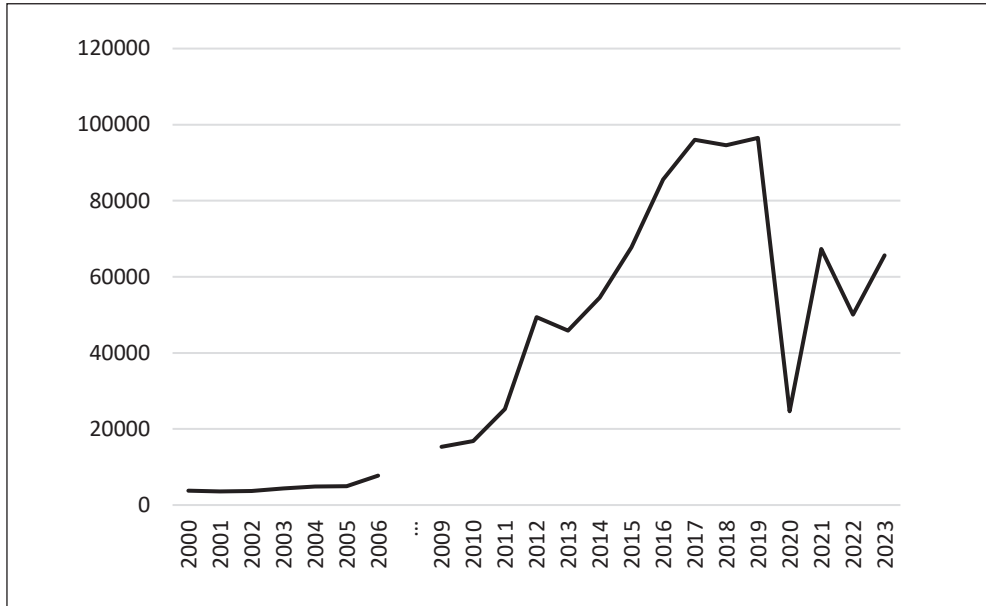
Based on the foregoing, there are a number of tasks that can be successfully tackled by this research:

1. to analyze the composition of tourists in the former Residence of the Bukovynian Metropolitans based on the above information for separate marker years.
2. to explain the types of visitors to the Residence and their changes due to factors that may be universal for arrivals to any center of sightseeing tourism.
3. to analyze the seasonality of visits to the Residence as a whole and for separate segments.
4. to establish factors of seasonality that may have a universal impact.

RESEARCH RESULTS

In a previous publication (Korol et al., 2023), an analysis of tourist arrivals to Chernivtsi established that in sightseeing tourism centers with a UNESCO-listed site, specially organized statistical research at such a site is representative of the entire city. The analysis of visitor changes made it possible to identify three periods of activity with the following significant triggers for change: the inscription of the site on the UNESCO World Heritage List, the annexation of Crimea by Russia in 2014, and the COVID-19 pandemic (see Figure 1). A fourth period has now been added: the full-scale war of Russia against Ukraine, which began on 24 February 2022.

Figure 1. General changes to visitor numbers to the Residence of the Metropolitans of Bukovyna and Dalmatia for the periods 2000–2006 and 2009–2023



data are missing for 2007–2008

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

ANALYSIS OF TYPES OF ARRIVAL

Domestic tourists. Research on visitors begins with an analysis of the share of domestic tourists, as well as of inbound visitors by country of origin. Domestic tourists accounted for an average of 90% over the research period. Such a significant share allows us to explain changes to the number of domestic tourists based on the results of the analysis of the total number of sightseeing visitors reported in the previous publication (Korol et al., 2023). We will not repeat ourselves but will briefly summarize: we can also distinguish *the first time period*, which was the longest (2000–2017), and had a pattern described by a mathematical function. Since 2012, it has been characterized by rapid growth caused by the inscription of the former Residence of the Bukovynian Metropolitans onto the UNESCO World Heritage List.

We have identified *the second period* (2017–2019) as a *period of stagnation* with a slight fluctuation in 2018. Activity reached its maximum value for the entire period and remained approximately at the same level. The hypothesis about the impact of the annexation of Crimea by the Russian Federation in 2014 on the redistribution of visitor flows in different regions of Ukraine, in particular in favour of the west where Chernivtsi is located, was put forward and confirmed on the basis of the analysis conducted.

The third period (2019–2020) was marked by a sharp decline in the number of visitors to the former Residence which was caused by a *global force majeure event* – the

COVID-19 pandemic, followed by dynamic growth (2020–2021). The correlation analysis confirmed the dependence of activity on the quarantine restrictions imposed by the authorities. Instead, in 2021, changes to visitor activity, taking into account seasonality, directly depended on the number of patients with COVID-19.

The fourth period (2022–2023) was characterized by a decrease in activity compared to the previous year, 2021, due to the full-scale war of Russia against Ukraine. This led to the mass exodus of Ukrainians abroad and to safer, western, regions of the country, including Chernivtsi. The gradual resumption of activity at the Residence was initially driven by the desire of the internally displaced to learn more about the city that became their temporary refuge. Later, in 2023, this resumption was due to the relative safety of the city and the region compared to other parts of Ukraine, making it a suitable place for spending weekends, vacations and for the recovery and rehabilitation of military personnel. The number of domestic visitors reached pre-war levels (2021) (see Table 1, Figure 2), but did not reach the pre-COVID period, amounting to –24.63% compared to 2019.

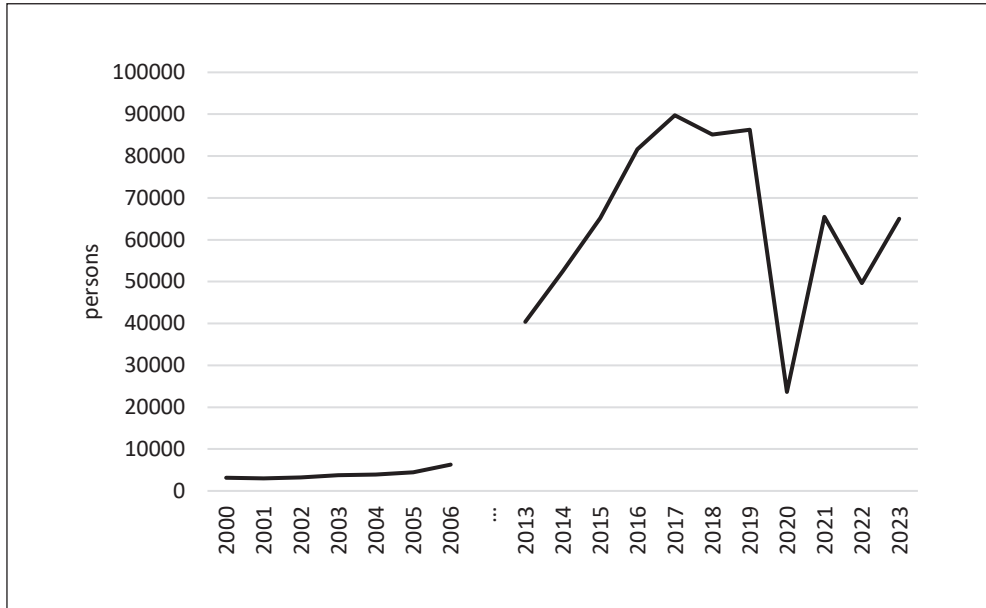
Table 1. Types of visitor to the Residence of the Metropolitans of Bukovyna and Dalmatia in 2000–2006 and 2013–2023

Year	General number of the tourists	Ukrainians			Foreigners		
		individuals	increment, %	share, %	individuals	increment, %	share, %
2000	3747	3154	–	84.17	603	–	15.83
2001	3580	2995	–5.04	83.66	586	–2.82	16.34
2002	3729	3250	+8.51	87.15	479	–18.26	12.85
2003	4362	3785	+16.46	86.77	577	+20.46	13.23
2004	4837	3901	+3.06	80.65	936	+62.22	19.35
2005	4994	4473	+14.66	89.57	521	–44.34	10.43
2006	7705	6314	+41.16	81.95	1391	+166.99	18.05
...
2013	45873	40370	–	88.00	5503	–	12.00
2014	54493	52514	+30.08	96.37	1979	–64.04	3.63
2015	67226	65207	+24.17	97.00	2019	+2.02	3.00
2016	85577	81637	+25.20	95.40	3940	+95.15	4.60
2017	96024	89740	+9.93	93.46	6284	+59.49	6.54
2018	94565	85115	–5.15	90.01	9450	+50.38	9.99
2019	96517	86265	+1.35	89.38	10252	+8.49	10.62
2020	24631	23607	–72.63	95.84	1024	–90.01	4.16
2021	67298	65458	+177.28	97.27	1840	+79.69	2.73
2022	50087	49667	–24.12	99.16	420	–77.17	0.84
2023	65633	65019	+30.91	99.06	614	+46.19	0.94

data are missing for 2007–2012

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Figure 2. Changes to the number of domestic visitors to the Residence of the Metropolitans of Bukovyna and Dalmatia for the periods



data are missing for 2007–2012

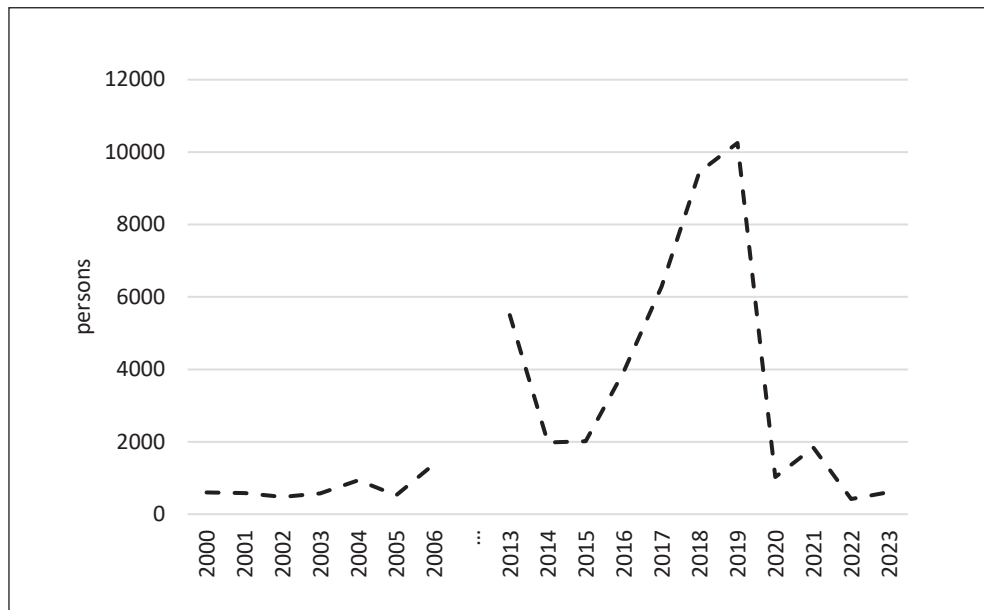
Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Inbound Tourists. The share of foreigners in the number of visitors to the former Residence of the Metropolitans of Bukovyna and Dalmatia is insignificant, on average 10%. Changes to their arrivals were influenced by local, nationwide and world events. First of all, it was the inscription of the former Residence of the Bukovynian Metropolitans onto the UNESCO World Heritage List in 2011. Although data for this and earlier years are missing, it can be asserted that this event significantly impacted the growth of inbound arrivals to Chernivtsi. This becomes clear from the comparison of data for 2006 and 2013 for both cases. Specifically, for inbound tourism to Ukraine as a whole, the growth in arrivals was insignificant, only by 1.2 fold from 21,714 in 2006 to 26,025 in 2013. For the Residence of the Metropolitans of Bukovyna and Dalmatia, the growth in inbound visitors was fourfold: from 1,391 in 2006 to 5,503 in 2013 (see Table 1).

The year 2014 was disastrous for inbound tourist arrivals to Chernivtsi: growth compared to the previous year, 2013, was negative and amounted to -64.04% for the Residence (see Figure 3, Table 1). The reason was national: Russia's military aggression against Ukraine, which began with the annexation of Crimea and the occupation of Donbas, and the number of inbound tourists decreased by 49.18% .

In 2015, changes to inbound tourist arrivals to Chernivtsi stabilized and then showed rapid growth. Specifically, the growth rates of visitors to the Residence ranged from $+95\%$ in 2016 to $+50\%$ in 2018. As a result, the maximum number of inbound visitors was recorded in 2019 – more than 10,000 (see Table 1). An explanation of this will be obtained from the analysis.

Figure 3. Changes to the number of inbound visitors to the Residence of the Metropolitans of Bukovyna and Dalmatia for the periods 2000–2006 and 2013–2023



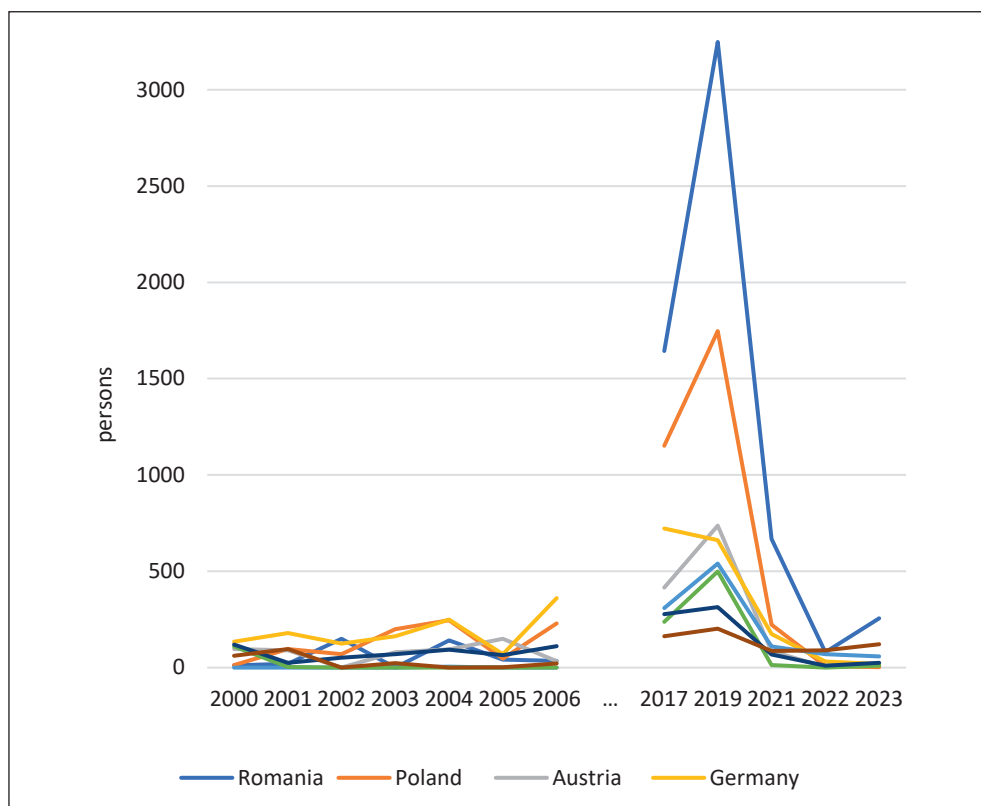
data are missing for 2007–2012

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University

This positive change was interrupted by the global event of COVID-2019, when in 2020 annual growth was negative to a level of -90% (see Table 1, Figure 3). In the next year, 2021, there was a significant increase in inbound visitors to the Residence (+79.69) due to the easing of quarantine restrictions (the implementation of flexible quarantine). However, Russia’s large-scale invasion of Ukraine in February 2022 caused a sharp decrease in inbound tourists at both national (-53.18%) and local (-77.17%) levels. The small number of visitors to the UNESCO monument in Chernivtsi that was still recorded (420 people) consisted of military journalists, volunteers and representatives of various international organizations. In 2023, the number of inbound tourists did not recover, unlike domestic tourists.

Types of inbound tourist by country of origin. Changes to inbound tourist arrivals to Chernivtsi showed a rapid growth during the period 2015–2019 mainly due to tourists from Romania and Poland (see Figure 4) which accounted for almost 45% of arrivals in 2017 and 49% in 2019. The tourists from these countries, especially in border regions where they most often travel from, had a perception of the situation in Ukraine after 2014 that was objective, formed personally or through the accounts of acquaintances who had been there. They knew that in regions far from Donbas, peaceful and safe life continued, everything was calm here. This can also be explained by the action of an economic factor that transformed the exchange rate. In 2014–2015, the Ukrainian hryvnia devalued threefold. Meanwhile, from the middle of 2013, after the second recession in the Eurozone, the national currencies of neighbouring countries stabilized, and per capita

Figure 4. Changes to the number of inbound visitors to the Residence of the Metropolitans of Bukovyna and Dalmatia by country of origin: 2000–2006 and 2017–2023



data are missing for 2007–2012

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

consumer expenditures increased. Due to the favourable exchange rate, the purchasing power of tourists from the EU in Ukraine significantly increased. Thus, the economic factor compensated for the negative impact of threats and dangers.

Table 2. Changes to inbound visitors to the Residence of the Metropolitans of Bukovyna and Dalmatia by country of origin

Countries Years	Romania	Poland	Austria	Germany	Moldova	Israel	Canada	USA
2000	11	14	96	134	0	110	120	62
2001	19	96	90	180	0	4	25	97
2002	150	70	0	125	0	0	52	0
2003	0	200	80	163	0	0	70	23
2004	141	246	95	249	5	0	93	0
2005	41	47	149	70	0	0	64	1
2006	34	229	33	361	0	0	112	21

...
2017	1644	1152	415	722	309	237	277	162
2019	3248	1747	737	662	540	499	314	202
2021	668	222	84	175	110	13	68	87
2022	79	9	3	32	70	0	10	90
2023	256	2	18	19	58	10	24	121

data are missing for 2007–2016

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Table 3. Types of inbound visitor to the Residence of the Metropolitans of Bukovyna and Dalmatia by country of origin

№	Country	2000		2004		2006		2017		2019		2021	
		pers.	%	pers.	%	pers.	%	pers.	%	pers.	%	pers.	%
1	Romania	11	1.8	141	15.1	34	2.4	1644	26.2	3248	31.7	668	36.3
2	Poland	14	2.3	246	26.3	229	16.5	1152	18.3	1747	17.0	222	12.1
3	Germany	134	22.2	249	26.6	361	26.0	722	11.5	662	6.5	175	9.5
4	Austria	96	15.9	95	10.1	33	2.4	415	6.6	737	7.2	84	4.6
5	Moldova	0	0.0	5	0.5	0	0.0	309	4.9	540	5.3	110	6.0
6	Israel	110	18.2	0	0.0	0	0.0	237	3.8	499	4.9	13	0.7
7	Canada	120	19.9	93	9.9	112	8.1	277	4.4	314	3.1	68	3.7
8	USA	62	10.3	0	0.0	21	1.5	162	2.6	202	2.0	87	4.7

data are missing for 2007–2016

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

The presence of Romania, Poland, Germany and Moldova among Chernivtsi visitors can be explained by the border position of Chernivtsi Oblast in the southwest of the country, proximity factors and historical heritage. The territory of Chernivtsi region has a state border with a length of 404.4 km, including 226.4 km with Romania and 178 km with the Republic of Moldova, and this ensured the leading position of these countries in the structure of visits to Chernivtsi. At the same time, despite similar lengths of land border, their shares in 2017–2019 differed by 5–6 times in favour of Romania. This is explained primarily by the population size of Romania (21.66 million people in 2015) and Moldova (4.11 million people in 2018), which also differ by a factor of five. Additionally, not far from the border with the Chernivtsi region, within 100 km of Chernivtsi, there are two large Romanian cities, Suceava (approximately 90,000 inhabitants) and Botoşani (over 100,000 inhabitants). For instance, the distance from Chernivtsi to the nearest major city in Moldova, Bălţi, is over 200 km.

In the first period of the study, from 2000 to 2006, Germany and Poland held first and second positions. In 2017–2019, they conceded the top spot to Romania. These two countries are distant: the distance from Chernivtsi to the Polish border is 350 km and 1,000 km to the German border. Taking into account such a distance, Chernivtsi seems to be interesting for tourists from Germany. For example, even before the inscription of the Residence onto the UNESCO World Heritage List, German tourists accounted for 26% in 2006 (see Table 3).

Germany is a global leader in outbound tourism. In 2018, residents of this country made 108 million departures, with an average of 131 departures per 100 Germans. Annual vacations are considered extremely important for most Germans and are seen as a reward for hard work throughout the year. Additionally, there is another reason that could be placed at the forefront. Chernivtsi was interesting not only to tourists from Germany but also from Austria with the latter typically holding fourth position among inbound visitors to the Residence. Thus, it can be stated that Chernivtsi is particularly popular with German-speaking tourists, who form a discrete segment. This heightened interest can be explained by a historical factor: from 1775 to November 1918, Chernivtsi and the entire Bukovyna were part of the Austrian, and later Austro-Hungarian Empire. During those years, the city acquired its Central European image with a characteristic Austro-Hungarian architectural style and urban infrastructure. It was also during this time that the Residence of the Metropolitans of Bukovyna and Dalmatia was built (1864–1882).

ADULTS, PUPILS AND STUDENTS

Adults. The average share of adult visitors during the study period is 66% (i.e. two-thirds of the total number of visitors to the Residence) with slight fluctuations from year to year within the range of 63–69%, reaching a minimum of 53% in 2002 and a maximum of 79% in 2006. The largest number of adult visitors was in 2018 with more than 63,000 tourists (see Table 4 and Figure 5).

Table 4. Type of visitor (adults – pupils/students) to the Residence of the Metropolitans of Bukovyna and Dalmatia in 2000–2006 and 2015–2023

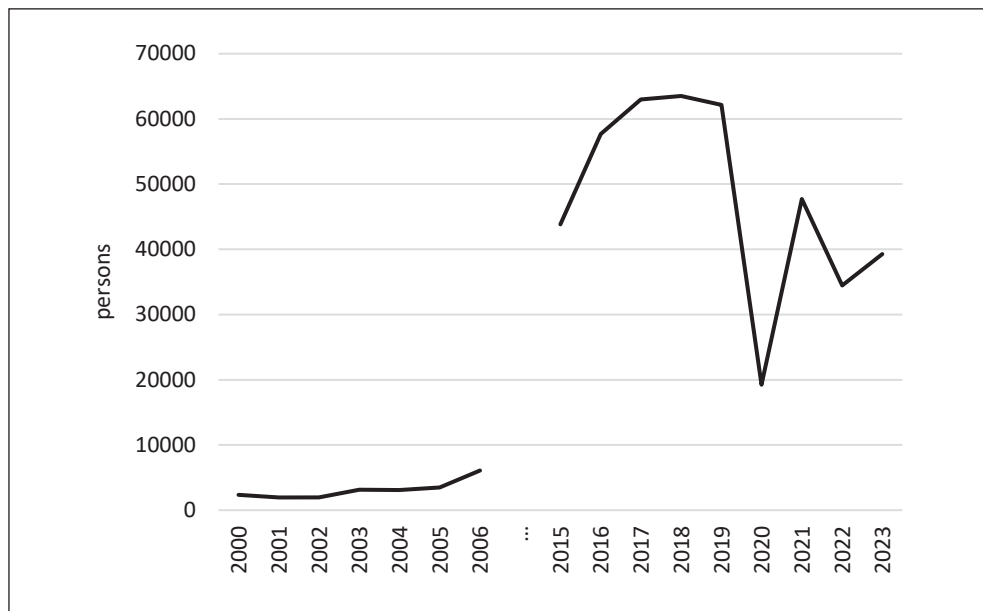
Years	Total number of tourists	Adults			Pupils/students		
		persons	increment, %	share, %	persons	increment, %	share, %
2000	3747	2373	–	63.33	1374	–	36.67
2001	3580	1948	–17.91	54.41	1632	+18.78	45.59
2002	3729	1975	+1.39	52.96	1754	+7.48	47.04
2003	4362	3133	+58.63	71.82	1229	–29.93	28.17
2004	4837	3105	–0.89	64.19	1732	+40.93	35.81
2005	4994	3459	+11.40	69.26	1535	–11.37	30.74
2006	7705	6101	+76.38	79.18	1604	+4.49	20.82
...
2015	67226	43840	–	65.21	23885	–	35.53
2016	85577	57681	+31.57	67.40	27896	+16.79	32.59
2017	96024	62977	+9.18	65.58	33047	+18.46	34.41
2018	94565	63515	+0.85	67.16	31050	–6.04	32.83
2019	96517	62170	–2.11	64.41	34347	+10.62	35.59
2020	24631	19253	–69.03	78.17	5408	–84.25	21.96
2021	67298	47708	+147.79	70.89	19608	+262.57	29.14
2022	50087	34435	–27.82	68.75	15652	–20.17	31.25
2023	65633	39282	+14.08	59.85	26351	+68.36	40.15

data are missing for 2007–2014

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Changes in the number of adult visitors to the Residence (see Figure 5) and changes to the total number are synchronous during the study period, with the exception of 2023 (see Figure 1). Therefore, they can be explained by the same reasons. While the total number of sightseers in 2023 reached the pre-war figure, the number of adult visitors was 1.2 times lower than in 2021, which has reasons related to the war in Ukraine. According to the staff guides of the Historical and Architectural Museum Complex of the Chernivtsi National University in 2022–2023, the majority of adult visitors were women and a small percentage were men of retirement age. The reasons for this are mobilization measures and restrictions on the movement of men in Ukraine during martial law.

Figure 5. Changes to the number of tourist arrivals (adult visitors) to the Residence of the Metropolitans of Bukovyna and Dalmatia for the periods 2000–2006 and 2015–2023



data are missing for 2007–2014

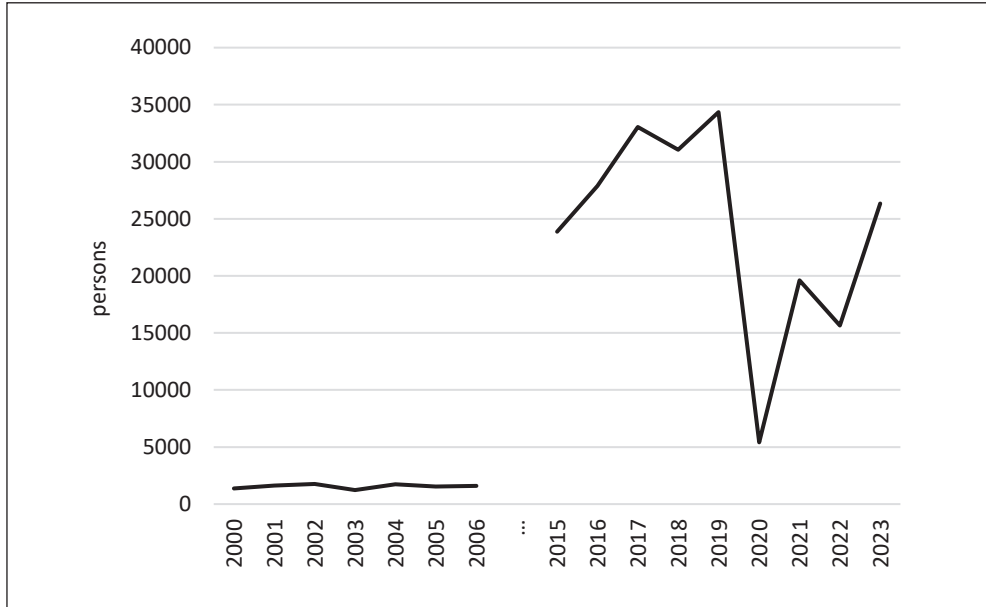
Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Pupils/Students. The average share of pupils/students among visitors to the Residence remained at the level of 31–35%. Their maximum share was noted in 2001–2002, when they accounted for about 46%, the minimum about 21% in 2006 and in the ‘Covid’ year of 2020, when quarantine restrictions were in effect. The largest number of pupils/students visited the Residence in 2019 – more than 34,000. Unlike adult visitors, in 2023, the number of schoolchildren/students not only recovered to the pre-war 2021 level but exceeded it by 1.34 times (see Table 4, Figure 6). Owing to them, the total number of visitors in the Residence returned to the pre-war, post-COVID level.

A peculiarity related to pupils and students which is worth mentioning, is that they usually visit the Residence in organized groups (during school or student holidays), under the guidance of teachers/instructors who are not subject to mobilization restrictions. The

western regions of Ukraine, including the city of Chernivtsi and the Chernivtsi region, are relatively safe for conducting such activities which explains the significant increase in this share of visitors in 2023.

Figure 6. Changes to the number of visitor arrivals (pupils/students) to the Residence of the Metropolitans of Bukovyna and Dalmatia for the periods 2000–2006 and 2015–2023



Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

SEASONALITY

For analysis of seasonality, years when certain factors could have influenced the distribution of visitors by months are not suitable. This primarily concerns 2020 and 2021, which were marked by COVID-19 quarantine restrictions, the severity of which varied from month to month depending on the epidemiological situation in different regions of Ukraine. The impact of the latter was analyzed in a previous publication (Korol et al., 2023). We also did not consider 2022–2023, when the full-scale invasion of Russia into Ukraine began, and visiting activity in the first months of the war decreased to a minimum, and its subsequent growth was associated with a significant number of internally displaced persons to the western region of Ukraine (including Chernivtsi) and the organization of free visits around the city and the Residence. The years 2017–2019 are ideally suited for the study of seasonality, a period of stagnation when the number of visitors to the Residence fluctuated with minimal annual variation. This plateau allows us to calculate the average monthly number of visitors for these three years and determine the seasonality for these indicators, increasing the representativeness of the results. Other

marker years, such as 2006 and 2013, were also taken into account. In this analysis, seasonality should be examined separately for domestic and inbound visitors, as well as for adults and children.

Seasonality can be calculated using the following formula (Korol & Krachylo, 2009):

$$E = \frac{100\sum|x - x_{cp}|}{\sum x}$$

where E is seasonality;

x is the number of tourists for a particular month;

x_{cp} is the average monthly number of tourists for the year.

The numerator here is the sum of the deviations of individual period levels from the average, taken with a positive sign, and the denominator is the number of tourists for the entire cycle.

The average seasonality index for domestic tourists in 2017–19 was 41.2. For inbound tourists, this figure was one third higher at 63.1 (see Table 5).

Table 5. Monthly distribution of domestic and inbound visitors to the Residence of the Metropolitans of Bukovyna and Dalmatia

Months	2006		2013		Average for 2017–2019			
	Ukrainians	Foreigners	Ukrainians	Foreigners	Ukrainians	%	Foreigners	%
January	472	0	955	103	3699	4.25	118	1.36
February	96	30	1183	125	2533	2.91	155	1.79
March	278	14	943	102	5041	5.79	236	2.72
April	598	244	1834	205	9026	10.37	554	6.40
May	674	351	5958	781	12115	13.92	1365	15.76
June	1024	181	3982	633	10310	11.84	906	10.46
July	272	136	4352	952	8632	9.92	1185	13.68
August	283	269	5174	1185	8998	10.34	1586	18.31
September	787	35	5675	780	7844	9.01	1300	15.01
October	1181	108	6153	440	11791	13.55	621	7.17
November	322	10	3016	118	4671	5.37	452	5.22
December	327	13	1145	79	2381	2.74	184	2.12
Total	6314	1391	40370	5503	87041	100	8662	100
Seasonality (E)	51.7	86.5	55.0	74.1	41.2	–	63.1	–

Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

For the adult visitors and pupils/students visiting the Residence of the Metropolitans of Bukovyna and Dalmatia, the seasonality indicators were 43.8 and 51.6, respectively (see Table 6).

Seasonality in tourism, as the name implies, is a consequence of climate. Different types of tourist and recreational activities have varying dependencies on annual temperature patterns and the distribution of precipitation. Beach and swimming recreation and skiing activities directly depend on these climatic characteristics; for example, in temperate latitudes, favourable conditions for them are created literally within just a few summer or winter months. Sightseeing tourism is less dependent on climatic

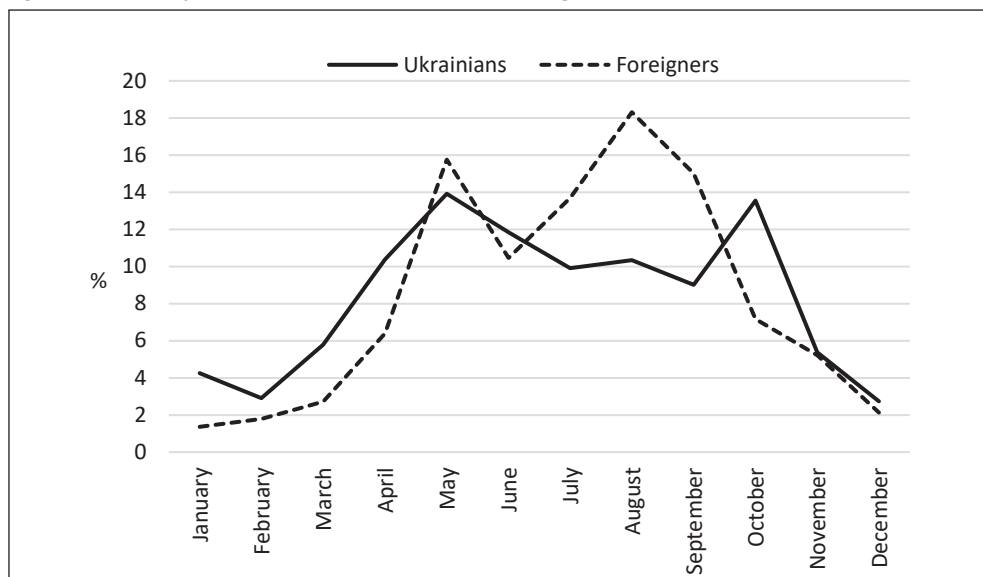
conditions, which are only a weather background for visits. However, sightseers are not willing to endure temperatures too uncomfortable for human thermal sensation. This is evidenced by the “dead” season in winter in the graphs of the monthly distribution of tourists visiting the Residence (see Figure 7, Figure 8).

Table 6. Monthly distribution of adult visitors and pupils/students visiting the Residence of the Metropolitans of Bukovyna and Dalmatia

Months	2006		Average for 2017–2019			
	adults	pupils/ students	adults	%	pupils/ students	%
January	377	95	2652	4.22	1166	3.55
February	117	9	2089	3.32	600	1.83
March	222	70	2971	4.72	2306	7.02
April	681	161	5940	9.45	3640	11.09
May	841	184	8246	13.11	5234	15.94
June	883	322	6980	11.10	4236	12.90
July	399	9	7558	12.02	2259	6.88
August	552	0	8478	13.48	2106	6.41
September	548	274	7131	11.34	2013	6.13
October	997	292	6127	9.74	6297	19.18
November	183	149	2973	4.73	2150	6.55
December	301	39	1742	2.77	823	2.51
Total	6101	1604	62887	100	32830	100
Seasonality (E)	47.6	72.3	43.8	–	51.6	–

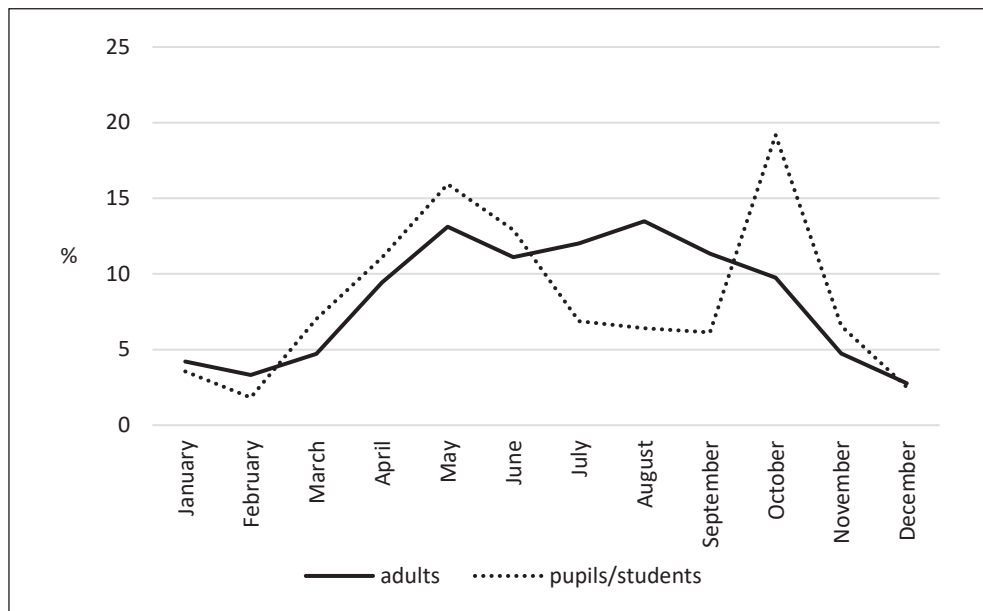
Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Figure 7. Seasonality of domestic and inbound visitors: average for 2017–2019



Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Figure 8. Seasonality of adult visitors and pupils/students: average for 2017–2019



Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

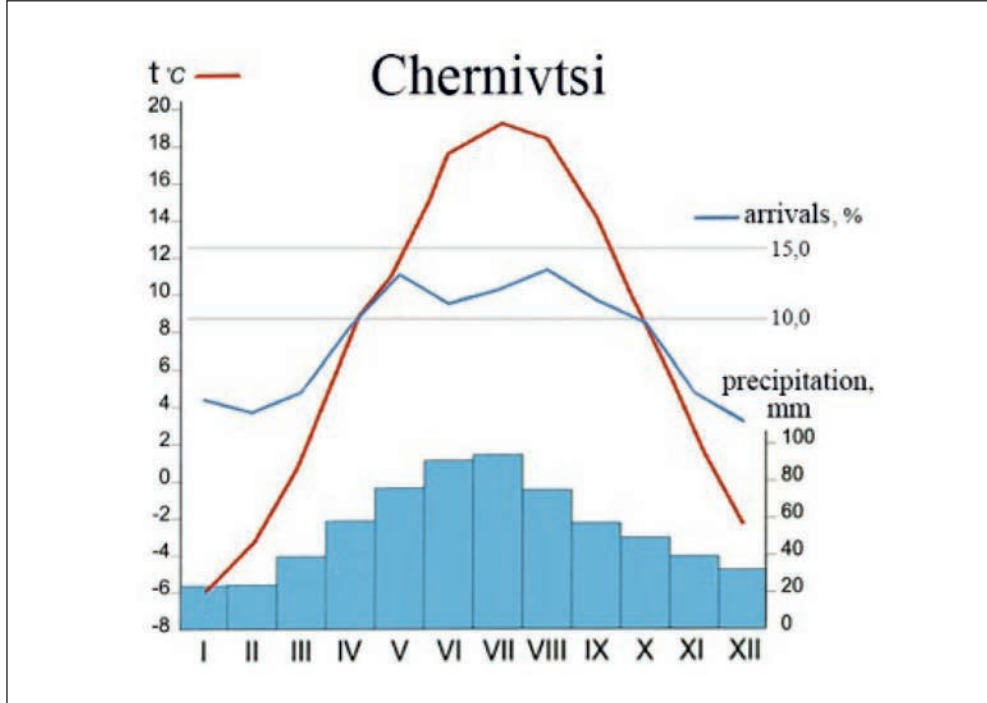
To analyze the impact of climate change throughout the year on the seasonality of sightseeing tourism, a monthly distribution of domestic adult tourist arrivals is most suitable. Weekend trips within Ukraine are feasible throughout the year. In such circumstances, the factor of long leisure time (vacations and holidays) has less of an impact on the monthly distribution of domestic adult tourists compared to foreigners, pupils and students. Inbound tourism is often more remote and, therefore, may be more time-bound to vacation periods, which are often taken during the summer, or to long weekends (weekends + holidays). Pupils and students have holidays in different seasons, which also affects the concentration of visitors in certain months (as will be shown below). These conclusions are confirmed by seasonality indicators, averaged for 2017–2019: for adult tourists – 43.8; for domestic tourists – 41.2; for inbound tourists – 63.1; for pupils and students – 51.6 (see Table 5, Table 6).

However, in our statistics, it is impossible to single out only domestic adult tourists. At the same time, on average for 2017–2019, domestic visitors accounted for 90%, therefore, for this category, we can consider only adult tourists.

The analysis of the percentage monthly distribution of adult tourists on average for 2017–2019 showed abrupt changes from 4.72% in March to 9.45% in April, and from 9.74% in October to 4.73% in November (see Table 5, Table 6). That is, reaching a monthly share of 10% of tourists can be an indicator of the beginning or end of the season, which in this case lasts from April to October. To determine the average daily air temperatures with which this season begins and ends, we superimpose the graph of the monthly distribution of the share of adult visitors on the graph of the annual course of average daily temperatures in Chernivtsi, so that they intersect at the 10% arrival level. As seen

in Figure 9, they intersected symmetrically at an average daily temperature of about 9°C. Thus, it can be determined that average daily temperatures below this mark do not provide comfort for the thermal sensation of a sightseeing tourist.

Figure 9. Climatogram of Chernivtsi and the seasonality of arrivals by adult visitors to the Residence of the Metropolitans of Bukovyna and Dalmatia

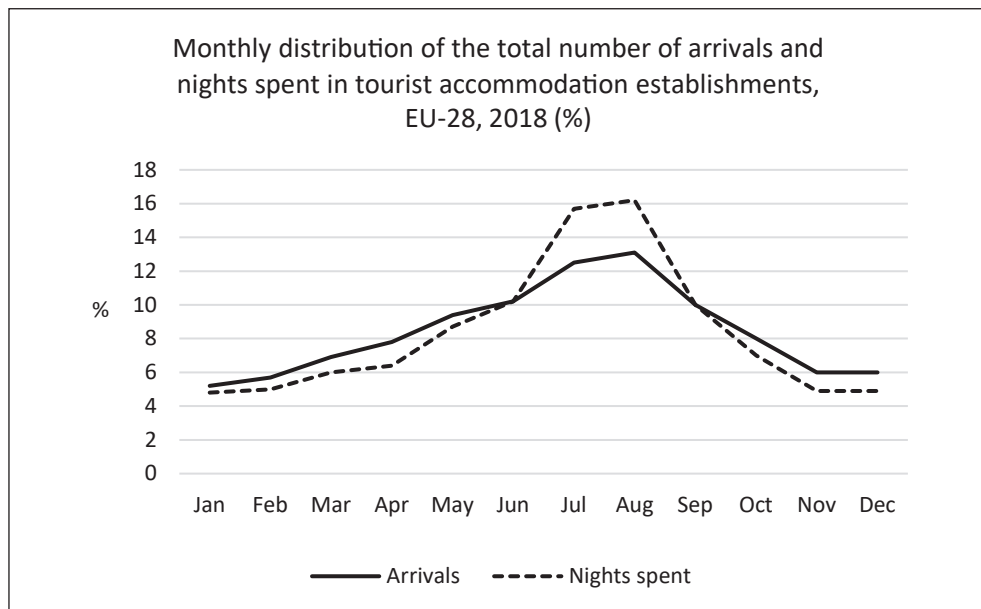


Source: compiled by the authors based on data from the statistical records of the Chernivtsi National University Historical and Architectural Museum Complex

Now, we consider the monthly distribution of visitors during the season. For all categories visiting the Residence, two peaks of arrivals are formed during the season (see Figure 7, Figure 8), however, they differ by month. For adults and inbound tourists, these peaks occur in May and August, and in June the number of arrivals drops significantly (see Figure 7, Figure 8). The summer peak can be explained by the seasonality of European tourism in general, which is highest in August and July. The occupancy rate of tourist accommodation facilities in the EU shows a clear seasonality and in 2018, the number of arrivals in tourist accommodation facilities peaked in August (see Figure 10).

However, the seasonality of pan-European tourism does not explain the May peak for both domestic and inbound visitors. It may only relate to sightseeing tourism, for which May offers the most comfortable climatic conditions. Also, the excursion “rush” can be attributed to the additional May weekends on state holidays. In Ukraine, May Day holidays, if coupled with (shifted to) weekends, form a short “vacation” traditionally used for short sightseeing tours. In Poland, May 1 and 3 are public holidays, the so-called Great May Weekend, when tourist sites have a real invasion of travelers. In Germany and Romania, May 1 is also a national holiday with a day off.

Figure 10. Seasonality of tourism in the European Union, 2018



Source: EUROSTAT (2020)

The overall increased activity in May can be explained by the phenomenon of pent-up demand, which “explodes” when favorable conditions finally arise for outdoor recreation: people tired of the long cold winter period, eager for active leisure with the onset of genuinely warm sunny weather, and thanks to several days off, “break free” from their homes far beyond the confines of their usual environment.

The seasonality of pupils and students, as already mentioned, is also characterized by two peaks, the May peak being common to all categories of visitors. However, the October peak requires a special explanation. It is so pronounced and significant in terms of volume (20% of visitors) that the second seasonality peak for overall domestic tourism is in October (see Figure 7, Figure 8). It should be noted that a similar peak for adult tourists, 90% of whom are domestic, falls in August. The explanation for this is quite simple: it is the autumn school holidays, which in Ukraine fall on the last 10 days of October. Trips and educational tours are traditional extracurricular activities that Ukrainian teachers engage in during the autumn holidays.

CONCLUSIONS

All conclusions can be divided into three groups: the first concerns the types of arrival that developed under favourable circumstances, that is, in the calm years of 2017–2019. The second conclusion concerns seasonality. The third one concerns the changes and, accordingly, the types of arrivals due to Russia’s annexation of Crimea and Donbas in 2014 and its full-scale invasion in 2022.

The analysis of the types of arrival confirmed the effect of factors, previously developed theoretically (Korol, 2018). In particular, the factor of transport and geographical location explaining the significant shares of neighbouring countries Romania and Moldova

in the, as well as Poland neighbouring Ukraine, which is also mentally close. At the same time, neighbouring Moldova was significantly inferior to Romania and Poland, explained by its low consumer tourism potential and formed by the population and its purchasing power, especially in the territories close to the border with the Chernivtsi region. Here we receive confirmation of the influence of such a regularity as the gravity model of tourist flows. This model, together with the mental factor (historical heritage, Korol, 2018) explains the significant share of German-speaking tourists: the historical center of Chernivtsi was built up during the Austrian times, when the German-speaking population of the city made up 20%. It is obvious that the historical heritage factor is important, above all, for sightseeing tourism.

The location of the city of Chernivtsi in temperate latitudes allows us to observe all seasons and their influence on seasonality in tourism. Despite the fact that sightseeing tourism is less dependent on climatic conditions, they still matter, as indicated by the pronounced summer plateau of tourist arrivals. For sightseeing tourism climatic conditions are considered as a 'weather background' and it has been established that average daily temperatures below 9°C do not provide comfortable temperatures for a sightseeing tourist. Another factor influencing seasonality is vacation time. In particular, the traditional May holidays and autumn school vacations create two peaks on the plateau of the seasonality. This is also observed in other parts of the world, for example, the March vacations for American students "spring break" create a seasonal peak of international tourist arrivals in the Caribbean.

Changes over time and in types of domestic and inbound arrivals to Chernivtsi are associated with events that have taken place not only in Ukraine but affected the entire European continent. Therefore, the results of the analysis are unprecedented. The military aggression of Russia in 2014, which was localized in the east of Ukraine, did not affect the growth of domestic visitors and temporarily (only for 1 year) negatively affected inbound arrivals. In this case, tourism showed high adaptive resilience. Domestic tourism after 2014 demonstrated growth due to the redistribution of domestic flows of Ukraine in favour of the western "quiet regions" where Chernivtsi is located. Foreigners from neighbouring countries were later personally convinced that western Ukraine, in particular Chernivtsi, was safe. At the same time their purchasing power increased as a result of the threefold devaluation of the Ukrainian hryvnia. Therefore, inbound tourist arrivals to Chernivtsi in 2015–2019, mainly due to Romania and Poland, showed rapid growth. However, after 2022 with a full-scale invasion, when Russia through missiles hit the entire territory of Ukraine, inbound tourist flows showed a significant irreversible decline. Domestic tourism after a year of war resumed to the post-COVID but pre-war 2021 but did not recover to the best pre-COVID years.

Thus, using the example of 'calm' Chernivtsi in Ukraine, nuances in the influence of the threat and danger factors on domestic and inbound tourism can be seen. In particular, if large-scale cataclysms occur only in one part of a country, then domestic tourism shows a redistribution to other regions. Inbound tourism initially reacts negatively, but later an interesting effect can be observed: the damage caused to the national economy leads to the devaluation of the local currency and this begins to attract inbound tourists from neighbouring countries to regions not affected. If cataclysms affect the entire territory of the country, then domestic tourism decreases, but later shows adaptive stability due to redistribution. This can be explained by the effect of relative safety; for residents of Ukraine, Chernivtsi in the west is still safer than the eastern regions where

they live. For foreigners, this does not work, because the comparison is with the safe country where they live.

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