

## RESEARCH ON THE DISTRIBUTION OF AIRBNB ACCOMMODATION IN MAJOR EUROPEAN DESTINATIONS

Elena HERTE<sup>1</sup>, Alina BADULESCU<sup>2</sup>

<sup>1</sup>*Department of Economics and Business, Faculty of Economic Sciences, University of Oradea, Oradea, Romania*

<sup>2</sup>*Department of Economics and Business, Faculty of Economic Sciences, University of Oradea, Oradea, Romania*

[elena\\_stiubea@yahoo.com](mailto:elena_stiubea@yahoo.com)

[abadulescu@uoradea.ro](mailto:abadulescu@uoradea.ro)

**Abstract:** *The Airbnb platform, one of the most popular platforms of its kind, is present worldwide, with a variety of accommodations, depending on the type of accommodation it offers (single room, whole apartment, etc.). In this article, we set out to analyse the spatial allocation of accommodation and the density of Airbnb listings in comparison with hotel establishments in Europe. For the spatial analysis of Airbnb accommodations we used data from the Inside Airbnb website and QGIS, an application used for geographic information systems (GIS) that supports visualization, editing, and analysis of geospatial data. In this way, we created a geospatial database that helped us better understand the dynamics of each location. After analysing the data we concluded that a consequence of the concentration of Airbnb accommodation is that life in these areas has become more expensive and more crowded for locals. Airbnb accommodation has caused inconvenience not only to hotel owners but also to locals. In addition, Airbnb is having a strong impact on the rental market by increasing rental prices. Another trend that can be seen from the distribution of Airbnb accommodation is that in cities with a seafront location, accommodation is located close to beaches and most accommodation is of the entire home/apartment type. Differences in the frequency of use and prices of listings highlight the geographical inequality in the benefits and impact of Airbnb's activity. The Airbnb offer is not a uniform segment of tourist accommodation and its effects on destinations are important and should therefore be analysed in relation to the territorial context.*

**Keywords:** distribution; Airbnb; platform; GIS.

**JEL Classification:** O35

## **1. Background**

Airbnb is present in many of Europe's iconic cities, but that doesn't mean these are the only cities where it operates. Nationally and internationally, there is not much research showing that the distribution of Airbnb's accommodation supply generally expresses the distribution of tourism demand and conventional accommodation capacity (Adamiak et al., 2019; Domènech et al., 2019; Strommen-Bakhtiar & Vinogradov, 2019). In terms of how Airbnb accommodations are distributed at the city level, as well as what the platform's accommodation supply is, a cartographic representation of them would help to form a pertinent picture of how accommodation units are arranged in cities. A comparison between cities in terms of the number of Airbnb accommodations and their structure (e.g. share of tourist rentals, business rentals, etc.) will allow to assess the importance of Airbnb for each tourist destination. At the same time, it can help to generalise the results of the study to the respective area.

An overview of these issues may help to improve the results related to Airbnb accommodation in different cities and may also mean a clarification of these factors in relation to Airbnb accommodation. As a result, we aimed to perform an analysis of Airbnb accommodations in several representative European cities in terms of tourism. We looked at how Airbnb accommodations are distributed at city level and what the platform's accommodation offer is. We made a cartographic representation of them to form a relevant picture of how accommodation units are arranged in cities. An overview of these aspects helps to improve the results related to Airbnb accommodations in different cities and can also mean a clarification of these factors in relation to Airbnb accommodations. Next, we make a comparison of Airbnb accommodations in different cities in Europe in terms of the number of different types of offers (private room, shared room, entire apartment/house, etc.), their distribution in relation to tourist resources, the growth of Airbnb bookings, the frequency with which Airbnb accommodations are booked, customer satisfaction, prices.

## **2. Cartographic analysis of the Airbnb listings in the main cities of Europe**

### **2.1. Methodology**

For the spatial analysis of Airbnb accommodations we used QGIS. This is an application used for open-source desktop geographic information systems (GIS) that supports visualization, editing, and analysis of geospatial data in addition to map

composition and export. We also used data from the Inside Airbnb website. In this way, we created a geospatial database that will help us better understand the dynamics of each location. In the data exposition, the cities were presented in alphabetical order.

The datasets contain the geographic coordinates of Airbnb listings, information on property types (entire home/apartment, private room, shared room or hotel room).

The analysis includes two main indicators:

- a) spatial allocation of accommodation and
- b) density of Airbnb listings.

## Results

Below we present the distribution of Airbnb accommodations according to the type of accommodation they offer (single room, entire home/apartment, etc.) in different European cities.

Legend:

- Private room
- Blue - whole house/apartment
- Yellow - hotel room
- Green - shared room

## 2.2. Cartography of Airbnb listings in major cities

Barcelona is an emblematic city for Spain, both in terms of tourism and culture. The very high, even excess, demand for bookings in this city has led to the emergence and development of a large number of Airbnb accommodations. In fact, there have been times when hotels could no longer meet the demand for accommodation services, and in such a context, Airbnb has benefited. It can be seen from Figure 1 below, the layout of Airbnb in this city. Most accommodation is located in the city centre, close to tourist attractions and public transport, and along the Mediterranean coast. The types of accommodation offered by Airbnb are mostly apartments or entire houses, followed by single-room rentals. Hotel rooms and shared rooms are insignificant compared to other types of accommodation.

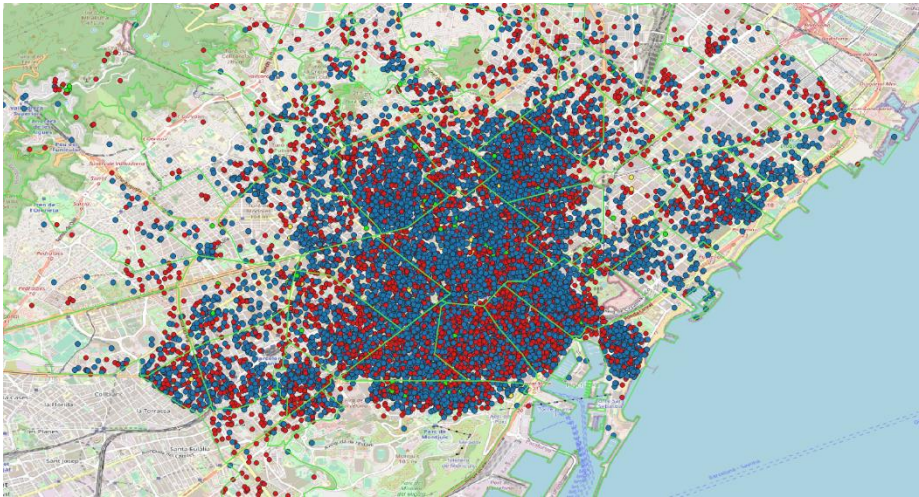


Figure 1: Distribution of Airbnb accommodations by accommodation type in the city of Barcelona (Spain)  
Source: Made by the authors with QGIS geospatial analysis software based on data retrieved from Inside Airbnb

Crete is a popular and desired tourist destination. It can be seen from the figure below that the trend of distributing Airbnb accommodation along the coast continues, as in the case of Spain. Most accommodations are concentrated in the northern part of the island, near the capital Heraklion and the town of Chania, this is also due to the fact that they are closer to the airport and tourists do not have to travel a long distance between the airport and the accommodation. Entire apartments/houses predominate in Crete, which is understandable given that it is a tourist destination visited mostly in summer.



Figure 2: Distribution of Airbnb accommodations by accommodation type on the island of Crete (Greece)  
Source: Made by the authors with QGIS geospatial analysis software based on data retrieved from Inside Airbnb

Rome is a city where rates for a night's accommodation are high, especially in its central area. Airbnb offers affordable accommodation for those on average incomes. The highest concentration of Airbnb accommodation is in the centre of Rome, where the offer includes both entire apartments/houses and single rooms. In the central area there are also a few "shared room" accommodations, which means that the price is quite high for accommodation and in this situation people prefer to share a room.

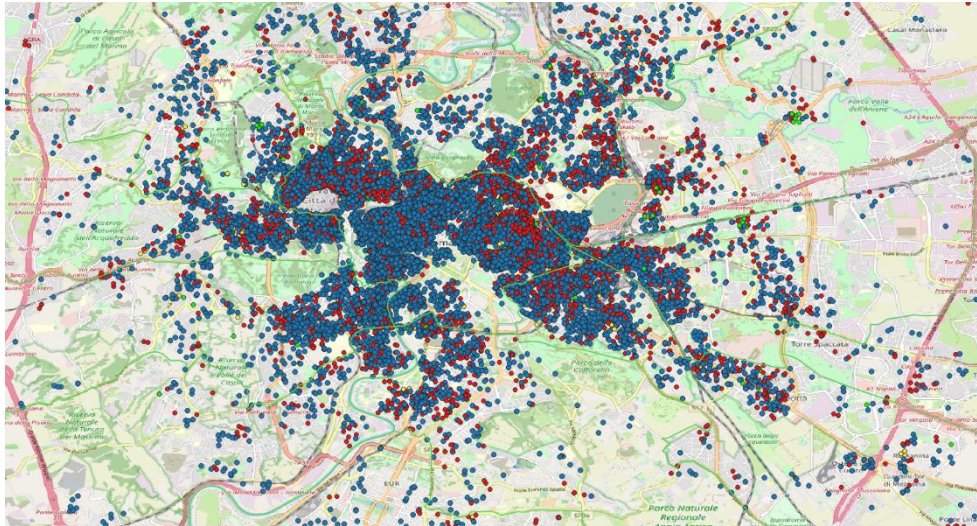


Figure 3: Distribution of Airbnb accommodations by accommodation type in the city of Rome (Italy)  
Source: Made by the authors with QGIS geospatial analysis software based on data retrieved from Inside Airbnb

Europe's most visited city, Paris, also has a large number of Airbnb accommodations. It is somewhat expected that the city centre will have the most Airbnb accommodation, as this is also where most of the tourist attractions are. In Paris we find 56,726 Airbnb accommodations, of which 85.2% are entire homes/apartments (Inside Airbnb, 2023). In general, tourists are looking to find accommodations in close proximity to the sights in order to avoid using private or public transportation. One reason could be the cost of transport, and another could be traffic congestion, which is very high in the French capital. People prefer not to waste time looking for transport and sitting for a long time in transport. Whole houses or apartments also predominate in the Paris accommodation market. Single rooms are few and far between, and shared rooms are even fewer. Airbnb accommodation is sporadic on the outskirts of the city, but all types of accommodation are present.

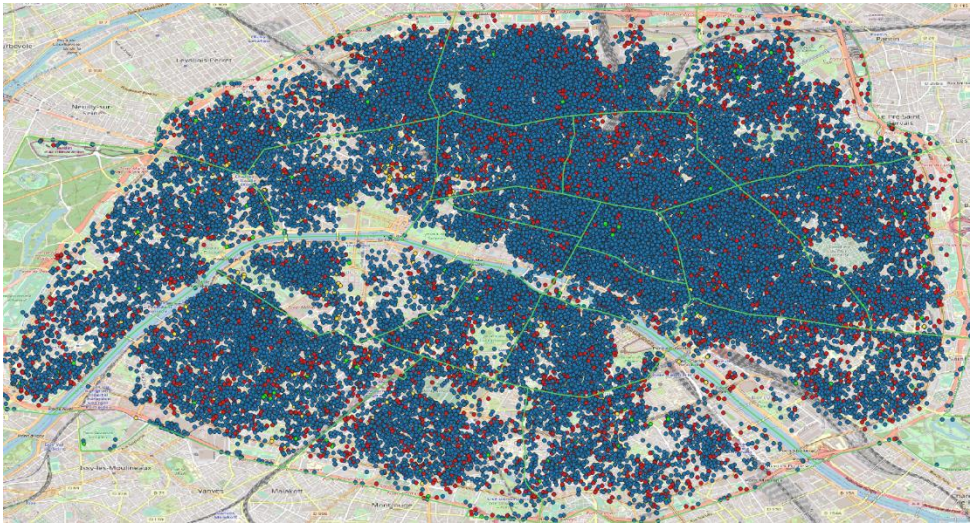


Figure 4: Distribution of Airbnb accommodations by accommodation type in the city of Paris (France)  
Source: Made by the authors with QGIS geospatial analysis software based on data retrieved from Inside Airbnb

There are 41,501 Airbnb accommodations in Istanbul, of which 66.7% are entire homes/apartments. The rule is the same as for the cities presented above. Thus, the accommodations are arranged in the central area of the city and along the Mediterranean Sea and less in the peripheral areas. Most of the accommodations are entire houses, followed by private rooms, and then shared rooms. Airbnb accommodations are also distributed in the peripheral areas, but not as many and evenly spread. Istanbul is a dynamic city, with an oriental yet modern feel, and the monuments, historic buildings, various organised fairs will continue to attract tourists from all over the world, which is beneficial for existing Airbnb accommodation. Istanbul is not a cheap city, but through Airbnb you can visit it even on an average budget. Another advantage of accommodation booked through the Airbnb platform can be its central location.

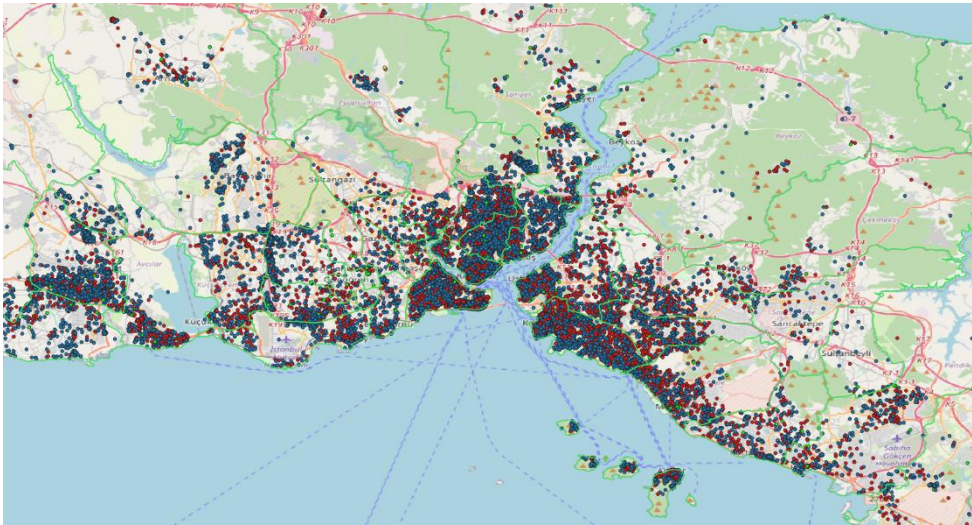


Figure 5: Distribution of Airbnb accommodations by accommodation type in the city of Istanbul (Turkey)  
Source: Made by the authors with QGIS geospatial analysis software based on data retrieved from Inside Airbnb

### 3. Geographical variation in the supply and use of Airbnb accommodation

There is also a clear trend of geographical dispersion within the cities analysed. There is a spread from the centre of the cities, where they are most concentrated, to the periphery. At the same time, it can be said that Airbnb has moved away from the large metropolises towards the tourist areas and smaller towns. Airbnb's mature markets, the number of Airbnb listings outside the big cities is growing faster than in these cities. Airbnb's offering is becoming more professional and more tailored to the needs of consumers.

Comparing Airbnb offerings in different European countries, however, shows differences in the size and structure of the housing stock. Mapping of Airbnb accommodations shows that Airbnb is more popular in large cities such as Paris, Rome, Vienna and in tourist destinations, especially in Mediterranean Europe.

We could also observe that in iconic tourist destinations entire houses/apartments predominate in the ad structure, while in smaller cities we find relatively more rooms available for rent. Of course, the Airbnb offer differs from one city to another. The most important Airbnb markets in Europe are in Paris (France), London (UK), Rome (Italy), Barcelona (Spain).

It can also be seen that across Europe, entire properties outperform private rooms. Apartments, entire houses, rooms in houses, followed by rooms in apartments and rooms in guesthouses are the most common offers on the platform. It is not enough to simply give a descriptive overview of the numbers, prices, multiple

accommodation activity and reviews, but it is important to note the link between the socio-economic characteristics of the cities with the location characteristics within each city.

Most studies published in the literature on Airbnb often use case studies from North America and Western Europe, as they are considered the largest marketplaces and the first of their kind (Ginindza & Tichaawa, 2019; Guttentag, 2019). The impact of the platform and the way it is developed differs from city to city and from region to region, due to fluctuations in the characteristics of the real estate market, but also of the tourism industry in that area. For example, in Mediterranean and southern European countries, Airbnb is thought to be a tool for increasing the use of second homes or those owned in rural or tourist areas (Adamiak, et al., 2019; Belotti, 2019). Regarding Central and Eastern Europe, the high concentration and professionalisation of holiday rentals through Airbnb and other platforms is related to the unregulated housing market (Ključnikov, et al., 2018; Roelofsen, 2018).

In economically developing countries in Europe (Romania, Hungary, Bulgaria), renting through Airbnb is part of the local traditions of hosting, home-stay and informal tourist accommodation services, and the platform provides a marketing tool to attract international tourists (Bandara, 2019; Kagermeier, Amzil, & Elfasskoui, 2017; Ruiz-Correa et al., 2018).

It should be taken into account that the activity of platforms is closely related to the regulatory methods of countries' legal systems and local competition, whether from the collaborative or classic hospitality industry. In Europe, as in North America for that matter, regulations on short-term rentals are, as a rule, set locally (Nieuwland & van Melik, 2018; Oskam, 2019).

Although not part of Europe, we will recall Japan as an example of a country that introduced a nationwide law on private accommodation, forcing the platform to control the official registration of offers, which led to a reduction in the number of ads by 80% in summer 2018 (Matsui, 2019; Nikkei Asian Review, 2018).

Airbnb has more competitors in the global market (Hajibaba & Dolnicar, 2018), than in the European market. Very important is the competition from Chinese platforms, due to their very large size of the tourism market. Despite the fact that Airbnb has implemented Chinese regulations regarding the internet and considers China as the main market for future expansion (Jing & Soo, 2019), it still faces fierce domestic competition from platforms (Xiang & Dolnicar, 2017).

While until a few years ago, the growth of Airbnb platform was exponential, recently there has been a slowdown in Europe. Possible causes could be market saturation or lack of precise regulations, leading to the blocking or reduction of Airbnb supply in many of Europe's major cities. According to AirDNA (2019), between Q3 2017 and



2019, the number of active Airbnb and HomeAway listings decreased by 19% in Paris. On the other hand, Airbnb offerings continue to expand in other parts of the world: over the same period, the number of active listings increased by 150% in Beijing, 135% in Nairobi and 71% in Bogota. It is therefore particularly important to investigate the dynamics and impact of the platform in developing markets.

By presenting maps of different European cities we wanted to provide a comprehensive picture of geographical variation in the supply and use of Airbnb accommodation. Across Europe, Airbnb's main accommodation offerings are full accommodations, with people who have more than one listing on the platform providing more than half of the platform's accommodation offerings. Airbnb is present in most major European cities and on most islands. In addition, according to Inside Airbnb (2021) half of Airbnb's total offer is located in Europe. Even so, the platform's popularity is higher in Western, Northern and Mediterranean Europe than in the rest of Europe. The majority of people booking accommodation through Airbnb are travelling for tourism and not for business.

The total number of Airbnb listings in cities is influenced by their tourism and economic development. The size of the tourist flow is a factor influencing the number of accommodation listings by "professional" hosts (experienced hosts who have more than one listing on Airbnb).

The location of offers within each city, especially professionally oriented ones, depends on the distribution of its main tourist attractions. There are also differences in the frequency of use of these services and the prices of listings between and within cities. There are no systematic differences in the rating of rooms and accommodation, but, for example, in Paris rooms are rated higher, while in Prague they are rated lower.

Single rooms are relatively more frequently used than entire homes in Northern and Western Europe, while in Central and Eastern Europe (e.g. the Czech Republic) entire homes are most often used. This shows differences between parts of Europe, with Iceland, for example, being more likely to use accommodation whose hosts have more accommodation listed on the platform.

In general, accommodation in large metropolitan areas is more frequently rented than in other areas. In global terms, they are also slightly cheaper than accommodation outside the big cities. In Spain, listings on the coast are more numerous than offerings in big cities, but the relationship is the opposite when looking at the number of reviews per year.

Accommodation capacity is lower in Central and Eastern European cities than in Western, Northern and Mediterranean Europe. These differences seem to result from the average living space in homes, but also from the different perception of living

comfort. The difference in capacity between rooms and homes further exaggerates the dominance of the latter in accommodation capacity.

The structure of listing types differs from location to location. In general, the share of rooms is somewhat higher in large metropolitan areas and smaller towns than in the main tourist leisure destinations (coastal or ski areas). This can be explained by differences in the availability of accommodation and by the difference in the needs of short-stay urban tourists and long-stay coastal or mountain tourists respectively.

#### 4. Conclusion

The research results illustrate that there are certain similarities between the destinations analysed when it comes to Airbnb spatial behaviour. Airbnb accommodations are concentrated in central areas in most of the cities studied, competing strongly with nearby hotels. At the same time, we can say that Airbnb listings focus on attractions and sights in the area close to the accommodation. Therefore, in terms of location, Airbnb wins over hotels because it has more listings available in that area. Given the large number of Airbnb accommodation units, which are basically nothing more than locals' homes, it can be said that the number of long-term rentals by locals, especially in tourist areas, has decreased significantly. Another consequence of the concentration of Airbnb accommodation is that life in these areas has become more expensive and more crowded for locals. Airbnb accommodation has caused inconvenience not only to hotel owners but also to locals. In addition, Airbnb is having a strong impact on the rental market by increasing rental prices.

#### References

1. Adamiak, C., Szyda, B., Dubownik, A., & García Álvarez, D. (2019). Airbnb offer in Spain – Spatial analysis of the pattern and determinants of its distribution. *ISPRS International Journal of Geo-Information*, 8(3), pp. 155.
2. Bandara, J. S. (2019). Tourism in post-conflict development: Making use of new opportunities in Sri Lanka. In D. Weerakoon & S. Jayasuriya (Eds.), *Managing domestic and international challenges and opportunities in post-conflict development*, pp. 173–194. Singapore: Springer.
3. Belotti, S. (2019). ‘Sharing’ tourism as an opportunity for territorial regeneration: The case of Iseo Lake, Italy. *Hungarian Geographical Bulletin*, 68(1), pp. 79–91.
4. Domènech, A., Larpin, B., Schegg, R., & Scaglione, M. (2019). Disentangling the geographical logic of Airbnb in Switzerland. *Erdkunde*, 73(4), pp. 245–258. doi: 10.3112/erdkunde.2019.04.01.

5. Ginindza, S., & Tichaawa, T. M. (2019). The impact of sharing accommodation on the hotel occupancy rate in the kingdom of Swaziland. *Current Issues in Tourism*, 22(16), pp. 1975–1991.
6. Guttentag, D. (2019). Progress on Airbnb: A literature review. *Journal of Hospitality and Tourism Technology*. Advance online publication. doi: 10.1108/JHTT-08-2018-0075.
6. Hajibaba, H., & Dolnicar, S. (2018). Airbnb and its competitors. In S. Dolnicar (Ed.), *Peer-to-peer accommodation networks: Pushing the boundaries*, pp. 63–76. Oxford: Goodfellow Publishers.
7. Inside Airbnb (2023). Disponibil la: <http://insideairbnb.com/get-the-data.html> (Accessed at: 28 March 2023).
8. Kagermeier, A., Amzil, L., & Elfasskoui, B. (2017). *Touristification of the Moroccan oasis landscape: New dimensions, new approaches, new stakeholders and new consumer formulas*. Disponibil la: [http://wordpress.kagermeier.de/wp-content/uploads/2017/09/Kagermeier-Amzil-Elfasskaoui\\_Colloque-Ait-Hamza\\_Tourisme-Oasis-Maroc\\_26-09-2017.pdf](http://wordpress.kagermeier.de/wp-content/uploads/2017/09/Kagermeier-Amzil-Elfasskaoui_Colloque-Ait-Hamza_Tourisme-Oasis-Maroc_26-09-2017.pdf) (Accessed at: 28 March 2023).
9. Ključnikov, A., Krajčák, V., & Vincúrová, Z. (2018). International sharing economy: The case of Airbnb in the Czech Republic. *Economics and Sociology*, 11(2), pp. 126–137.
10. Matsui, S. (2019). Is law killing the development of new technologies?: Uber and Airbnb in Japan. *Boston University Journal of Science & Technology Law*, 25, pp. 100–144
11. Nieuwland, S., & van Melik, R. (2018). Regulating Airbnb: How cities deal with perceived negative externalities of short-term rentals. *Current Issues in Tourism*, pp. 1–15. doi: 10.1080/13683500.2018.1504899.
12. Nikkei Asian Review (2018). *Airbnb removes 80% of Japan home-share listings*. Disponibil la: <https://asia.nikkei.com/Business/Airbnb-removes-80-of-Japan-home-share-listings> (Accessed at: 14 March 2023).
13. Oskam, J. A. (2019). *The future of Airbnb and the 'sharing economy': The collaborative consumption of our cities*. Bristol: Channel View.
14. Roelofsen, M. (2018). Exploring the socio-spatial inequalities of Airbnb in Sofia, Bulgaria. *Erdkunde*, 72(4), pp. 313–327.
15. Ruiz-Correa, S., Ruiz-Correa, I., Olmos-Carrillo, C., Rendón-Huerta, F. A., Ramirez-Salazar, B., Son Nguyen, L., & Gatica-Perez, D. (2018). Mi Casa es su Casa? Examining Airbnb hospitality exchange practices in a developing economy. *ACM Transactions on Social Computing*, 2(1), pp. 1–24.
16. Strommen-Bakhtiar, A., & Vinogradov, E. (2019). The adoption and development of Airbnb services in Norway. *International Journal of Innovation in the Digital Economy*, 10(2), pp. 28–39.
17. Xiang, Y., & Dolnicar, S. (2017). Networks in China. In S. Dolnicar (Ed.), *Peer-to-Peer accommodation networks*, pp. 148–159. Oxford: Goodfellow Publishers.